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THE WEEDEN ISLAND CULTURE: A PRELIMINARY DEFINITION

GORDON R. WILLEY

INTRODUCTION

THIS paper presents a major portion of the existing data concerning the Weeden Island complex of the Florida Gulf Coast. The most important sources of these data are the writings of the late Clarence B. Moore which deal with the results of several years of investigation of northwest and west Florida and adjacent regions. In the course of these investigations, Moore surveyed and excavated well over one hundred sites along this coast.[1] Sources of secondary importance are various smaller exploration reports of S. T. Walker,[2] F. H. Cushing,[3] J. W. Fewkes,[4] M. W. Stirling,[5] and the present writer.[6] In addition, available but unpublished notes and collections on Florida and reports dealing with geographically and culturally related areas of the Southeast were consulted. In spite of the uneven quality of much of these data, especially those instances where a careful, descriptive itemization of all of the materials from each site is not given, there is much information which should be reinterpreted in the light of new findings.

The Weeden Island ceramic style is the most distinctive and characteristic of the Florida Gulf Coast and has been recognized in the past under various names. In 1936, in a summary article on Florida archaeology, Stirling[7] applied the name "Weeden Island ware" to pottery similar to that taken from the burial mound at the Weeden Island site and found at many points along the Florida Gulf Coast. Since then it has been commonly used in Southeastern archaeology to refer to this pottery and the associated culture. In 1942, R. B. Woodbury and the writer published a résumé of recent stratigraphic studies in northwest

[1] Moore, 1900, 1901, 1902, 1903, 1907, 1918. A large part of the collections which Moore made from the Gulf Coast is now the property of the Museum of the American Indian, Heye Foundation, New York, where the material is available for further study.

[2] Walker, 1879, 1881, 1883. [3] Cushing, 1896.

[4] Fewkes, 1924. [5] Stirling, 1936.

[6] Willey and Woodbury, 1942. See also Holmes' (1903) discussion of northwest and west Florida. [7] Stirling, 1936.

Florida shell heaps.[8] A tentative chronological outline for the northwest Florida coast, established on the basis of these studies, included a Weeden Island period in the ceramic sequence. In the present article, numerous burial mounds in the same territory, previously excavated by Moore, have been equated with the Weeden Island ceramic period. This has been done through an analysis of the pottery found in the mounds. After they had been assigned to their proper period in a culture sequence, a selected number of the burial mounds were analyzed, on the basis of the available evidence, as to culture type.

Areal Distribution

Weeden Island mounds and midden sites extend along the entire Florida Gulf Coast except for the southern extremity of the peninsula. In the north, there are burial mounds of this complex as far west as Baldwin County, Alabama, on the east side of Mobile Bay. It is possible that others are to be found west of the bay, although Moore, who continued his surveys westward along the Mississippi coast, encountered none. Inland, none of the sites which Moore excavated on the Mobile or Alabama Rivers are Weeden Island, yet on the lower Tombigbee River, fifty to seventy-five miles from the coast, there are three mound sites which contained Weeden Island pottery and other characteristic Weeden Island traits.[9]

Eastward, Weeden Island sites are frequent on the Choctawhatchee River, extending into the interior for several miles from the coast.[10] On the Appalachicola-Chattahoochee-Flint system, the largest drainage flowing into the Gulf on the northwest coast, Weeden Island type mounds are reported by Moore one hundred miles upstream.[11] Evidence for the Suwannee River is not fully presented, but brief descriptions suggest the presence of Weeden Island burial mounds for some fifty miles up that stream.[12] Weeden Island, the type site, is located on the western edge of Tampa Bay, in Pinellas County.[13] Similar sites are found around the bay. South of the Tampa district, the Thomas Mound, on the Little Manatee River, near Ruskin, is the southernmost burial mound containing the usual Weeden Island aggregate of artifacts and burials.[14] Others, though unreported, may exist. I know of no large Weeden Island collections from sites south of the Little Manatee, although occasional typical sherds of Weeden Island incised and punctated types have been found. To the east, within the Florida peninsula,

[8] Willey and Woodbury, 1942.
[9] Moore, 1905, Payne's Woodyard, Carney's Bluff, Kimbell's Field, pp. 253–262.
[10] Moore, 1918. [11] Moore, 1903, 1907.
[12] Moore, 1902. [13] Fewkes, 1924.
[14] Moore, 1900, pp. 358–359 (also recent Smithsonian WPA excavations).

the range of the complex is unknown, although sporadic type sherds and vessels are illustrated from burial mounds on the St. Johns River.[15]

The Weeden Island period is the third in a sequence of four periods on the northwest Gulf Coast of Florida. The earliest occupation in the region is the Deptford, an upper Archaic or early Southeastern Woodland complex found also on the Georgia coast. The Santa Rosa-Swift Creek period, which succeeds the Deptford, is characterized by early Swift Creek Complicated Stamped pottery and a series of types which closely resemble the incised, punctated, and rocker-stamped Marksville types of Louisiana. Santa Rosa-Swift Creek is represented by village refuse and burial mounds. The latter are apparently the earliest to appear on the Florida Gulf. Weeden Island midden sites and burial mounds are very numerous, implying a population increase over the previous two periods.[16] Weeden Island is succeeded by the Ft. Walton period on the northwest coast and by comparable late periods farther to the south in the vincinity of Tampa Bay. The change from Weeden Island to Ft. Walton is marked in the north by the disappearance of burial mounds, and by the appearance of new incised pottery styles and of a few fairly large flat-topped substructure mounds.

The division of the Gulf Coast of Florida into West Florida and Peninsula areas by Holmes and Wissler[17] does not hold for the Weeden Island period. This division was undoubtedly prompted by the belief that the ceramics of the Ft. Walton period were definitive of the West Florida region. Since these late Ft. Walton types apparently do not extend in great strength to the east and south, the Weeden Island types were selected as the basis for the classification of the Peninsula area. Obviously, the patterns of culture distributions on the Florida Gulf Coast have changed through time; however, considering only the Weeden Island period, we can easily define a culture area along 400 miles of coast, with extensions inland or the rivers which flow into the Gulf.

In preparing the trait list for the Weeden Island mounds from Moore's published data,[18] the following procedure was used: First, his publica-

[15] Moore, 1894, Pt. 1, Pls. 2; 15 *4, 5*.

[16] An attempt was made to divide the Weeden Island of northwest Florida into early and late sub-periods on the basis of the changing frequencies of some of the pottery types and the appearance of new types. Although this is possible in midden sites, such a division is not practical for the Weeden Island burial mounds. Willey and Woodbury, 1942, p. 253.

[17] Wissler, 1938, pp. 268–269. See also Kroeber, 1939, pp. 101–108; Holmes, 1903, pp. 104–129.

[18] Exceptions are the Thomas Mound, recently excavated during the Smithsonian-WPA archaeological program in Florida, and the Weeden Island Mound proper, excavated and reported upon by Fewkes in 1924.

tions on Florida and adjacent regions were examined. A brief study showed that the Gulf Coast formed a cultural unit. After this preliminary review, a comparative trait chart was made for the area, and every site excavated by Moore was plotted upon the chart. Each site report was then inspected and the traits listed by Moore for that site were tabulated. Only positive occurrences of traits were plotted on the chart, but definite statements about the absence of specific traits were considered as secondary evidence in placing the mounds as to culture complex and period. Because of the lack of illustrations, artifacts have been listed simply as "arrow points," "spear points," etc. Unillustrated pottery also appears as "incised," "punctated," "check-stamped," "red-painted," or "plain," as Moore described it. However, illustrated pottery has been classified in a detailed manner, both as to style of decoration and vessel form.

The third step in the procedure was to eliminate those sites which did not show a reasonable degree of trait correspondence to the majority of the group. Pottery was used as a diagnostic in making these eliminations, and the ceramic sequence, established in the middens, was the guide for assigning the mounds to periods. Sites which showed a preponderance of vessels belonging to the Santa Rosa-Swift Creek or Ft. Walton pottery periods were deleted. Others were dropped from the list because they appeared to be intermediate between Weeden Island and Santa Rosa-Swift Creek, or between Weeden Island and Ft. Walton. A few sites not retained in the Weeden Island group are neither Santa Rosa-Swift Creek nor Ft. Walton, but seemingly belong to one or more complexes not fully recognized or not yet placed in the chronological scheme for Gulf Coast Florida. Finally, several sites were rejected because of the lack of sufficient data upon which to base a judgment.

The following sites, listed from west to east, were the ones ultimately selected. All are from Moore, with the exceptions noted. Brief site names are given, rather than the full titles originally used. The dates indicate the volume in which the site is described.

Coast
- Maester Creek (1901)
- Rocky Bayou (1901)
- Pippens Lake (1918)
- Basin Bayou (West) (1901)
- Mound near Point Washington (1901)

Choctawhatchee River
- Wise Bluff (1918)
- Spring Hill Landing (1918)
- Douglas Bluff (1918)
- McLaney Place (1918)

Coast
- West Bay Post Office (1902)
- West Bay Creek (1918)
- Larger mound, Burnt Mill Creek (1902)
- Smaller mound, Burnt Mill Creek (1902)
- Mound west of Burnt Mill Creek (1918)
- Fannings Bayou (1902)
- Holley Mound (1902)
- Sowell Mound (1902)
- Davis Point (West) (1902)
- Pearl Bayou (1902)
- Laughtons Bayou (A) (1902)

Coast
- Laughtons Bayou (B) (1902)
- Stranges Landing (1902)
- Davis Point (East) (1918)
- Farmdale (1918)
- Larger mound, Hare Hammock (1902)
- Smaller mound, Hare Hammock, or Crooked Island (1902, 1918)
- Gotier Hammock (1902)
- Indian Pass Point (1902)

Appalachicola River
- Burgess Landing (1903)
- Rock Bluff Landing (1918)
- Davis Field (1903)
- Mound at Bristol (1903)
- Aspalaga (1903)
- Sampsons Landing (1903)
- Kemps Landing (1907)
- Hares Landing (1907)
- Shoemake Landing (1907)
- Fullmores Landing (1907)
- Kerrs Landing (1907)

Coast
- Porters Bar (1902)
- Tucker Mound (1902)
- Marsh Island (exclusive of intrusive graves) (1902)
- Hall Mound (1902)
- Mound Field (1902)
- Bird Hammock (A) (1918)
- Mound near St. Marks (1902)
- Aucilla River (Lewis Place) (1902, 1918)
- Warrior River (A) (1902)
- Warrior River (B) (1902)
- Horseshoe Point (1902)
- Fowlers Landing (1903)
- Gigger Point (1903)
- Bayport (1903)
- Wekiwachee River (1903)
- Weeden Island (Fewkes, 1924)
- Mound near the Little Manatee River (Thomas Mound) (1900) (also recent unpublished excavation data)

Presentation of Traits

In the trait inventory which follows, most of the figures represent the number of sites, of the fifty-six selected as Weeden Island, in which the traits occur. The only exceptions are those given for pottery types and vessel forms, for only in the case of these items is consideration given to quantity within a site. Both the number of sites at which it occurs and the total number of specimens representing it are given for each type and form.[19] Some selection was undoubtedly exercised by the Indians in the kind of pottery placed with the dead; another factor must also be taken into consideration. The numerical proportions of pottery types actually found in each mound are only approximately indicated by the types illustrated for that site, since Moore's selection of pottery for illustrations was based rather on aesthetic judgment than on an attempt to picture a representative collection of the various types found in each site.

[19] Because of the additional and recent excavations at the Thomas Mound, more material was available from that site upon which to make trait computations. However, pottery types are listed for the Thomas Mound only as a single occurrence and single specimen for each type. This was done because by counting all specimens from Thomas (mainly sherds) the total for each type would, in many instances, have equaled that of all the other sites together.

Weeden Island Traits as Based upon the Listed Sites
(total of 56 sites)

Mounds (conical sand mounds)	
Less than 6 feet high	36
Over 6 feet high	20
Causeways or graded approaches or extensions	2
"Domiciliary" mounds in association	5
Circular enclosures of sand and/or shell	1
Evidences of fire in mound	7
Limerock covering for mound	3
Interior mound covering sub-floor pit	1
Burials	
Massed secondary burials	14
Scattered secondary burials	48
Scattered primary burials	probably most of mounds
Single burials on or below mound base	8
Multiple burials on or below mound base	11
Evidences of fire with burials	18
Masses of shell with burials	13
Limerock "tombs"	6
Burial positions	
Bunched or bundle	41
Single skull	31
Extended	1
Semi-flexed	4
Flexed	22
Cranial flattening (apparently anterior-posterior)	5
Arrangement of mortuary artifacts	
Mass pottery deposit	46
East side of mound	34
Northeast side of mound	7
Southeast side of mound	3
Center of mound	1
Location not given	1
Scattered pottery caches and vessels	31
Pottery with specific burials	12 (?)
Other artifacts (than pottery) scattered through mound	49
Other artifacts with specific burials	32
Vessel placed over skull	1
Chipped stone	
Knives	1
Flake and scrap	quite frequent
Lances	13
Projectile points	20
Chisels and scrapers	1
"Axes" (presumably chipped celts)	1
Ground stone	
Hammerstones and/or pebble hammers	11
Smoothing pebbles	7
Hones	8

Celts	27
Pendants or plummets	7
Sinkers	1
Gorgets	2
Elbow-type pipe	2
Pitted stone	1
Bannerstone	1
Discoidal stone	1
Minerals and metals	
Hematite	15
Galena, lump	6
Galena beads	1
Sheet mica fragments	26
Sheet mica spear points	6
Bitumen	3
Plumbago	1
Kaolin artifacts, possibly for pottery stamping	2
Fragments of sheet copper objects	6
Bone, teeth, etc.	
Animal and fish teeth, sometimes perforated	3
Cut animal jaws	1
Turtle shell rattles	1
Piercing implements of bone	2
Shell work	
Drinking cup	23
Shell pendants or plummets	2
Shell beads	8
Worked shell tools (conch columellae)	7
Pierced clam shells	1
Pottery, general characteristics (as given by Moore)	
Plain	56
Incised and/or punctated	53
Check-stamped	30
Complicated stamped	43
Red-painted	33
Pinched	9
Cord-marked	3
Black-painted	1
Fabric-marked	1
"Killed" pottery	53
Pottery made with holes	13
Pottery pipe (elbow form)	2
Pottery, specific types	
Weeden Island period types	
Weeden Island Plain	34 occurrences 90 specimens
Weeden Island Incised	41 occurrences 128 specimens
Weeden Island Punctated	14 occurrences 52 specimens

Swift Creek Complicated Stamped	22 occurrences 41 specimens
Tucker Ridge-Pinched	8 occurrences 8 specimens
Indian Pass Incised	7 occurrences 7 specimens
Weeden Island Zoned Red	6 occurrences 6 specimens
Carabelle Incised	7 occurrences 7 specimens
Carabelle Punctated	4 occurrences 5 specimens
Check-Stamped (probably Wakulla)	5 occurrences 6 specimens
Keith Incised	3 occurrences 3 specimens
Hare Hammock Surface Indented	2 occurrences 2 specimens
Santa Rosa-Swift Creek period types	7 occurrences 9 specimens
Crystal River complex types	6 occurrences 7 specimens
Late period types	8 occurrences 14 specimens
Cord-marked	1 occurrence 1 specimen
Unclassified	22 occurrences 30 specimens
Pottery, specific forms	
Flattened-globular bowl	29 occurrences 44 specimens
Squared flattened-globular bowl	5 occurrences 6 specimens
Collared globular bowl	9 occurrences 11 specimens
Simple bowl	5 occurrences 6 specimens
Globular bowl with flared orifice	3 occurrences 4 specimens
Shallow bowl or dish	1 occurrence 1 specimen
Flattened-globular bowl with effigies affixed	13 occurrences 15 specimens
Simple bowl with effigies affixed	2 occurrences 2 specimens
Flattened-globular bowl with handle	3 occurrences 3 specimens
Flattened-globular bowl with 4 lobes	3 occurrences 3 specimens
Flattened-globular bowl with multiple lobes (melon)	2 occurrences 2 specimens

Boat-shaped bowl with effigies affixed	1 occurrence 1 specimen
Simple jar	11 occurrences 14 specimens
Short-collared jar	13 occurrences 16 specimens
Squared short-collared jar	9 occurrences 9 specimens
Long-collared jar	9 occurrences 10 specimens
Simple jar with effigies affixed	8 occurrences 10 specimens
Cylindrical beaker	9 occurrences 12 specimens
Squared beaker	6 occurrences 7 specimens
Round beaker-bowl	2 occurrences 2 specimens
Squared beaker-bowl	1 occurrence 1 specimen
Pot with slightly converging orifice	4 occurrences 5 specimens
Pot with slightly flared orifice	5 occurrences 5 specimens
Multiple-compartment tray	7 occurrences 11 specimens
Double bowl	2 occurrences 2 specimens
U-shaped double-orifice vessel	1 occurrence 1 specimen
Cambered-rim jar	1 occurrence 1 specimen
Double-globed jar	7 occurrences 8 specimens
Single-globed jar	3 occurrences 3 specimens
Double-globed jar in semi-effigy form	1 occurrence 1 specimen
Single-globed jar in semi-effigy form	12 occurrences 17 specimens
Human effigy vessel	8 occurrences 8 specimens
Eccentric effigy vessel	2 occurrences 2 specimens
Wedge-shaped vessel	3 occurrences 3 specimens
Miscellaneous eccentric vessel	2 occurrences 2 specimens

DISCUSSION OF TRAITS

Mounds

Moore describes the sand burial mound as a low, circular tumulus of a domed or flattened-conical shape. Some were only a foot or so high; others were as much as 10 or 12 feet in height. The average would perhaps be about 4 feet. Diameters varied from 30 feet to over 100 feet. The mounds were constructed mostly of the gray, white, or tan sands of the Florida coast. Dark humus-stained areas, masses of charcoal or decayed wood, layers or lenses of shell, sand stained with red ocher, masses of clay, and limestone rocks were sometimes present in addition to the pure sand. But, according to the Moore data, evenly bedded strata showing a "layered" structure in cross-section were rarely found. Only in one instance does he give evidence for a small interior mound.[20] In this case, the inner mound covered a sub-floor pit, the bottom of which was lined with charcoal. Burned timbers and abundant charcoal in some of the mounds suggest that fires were made near the burials and that the sand and earth were sometimes piled over a wooden building which had been destroyed by fire.[21] Decayed but unfired logs and bark also suggest structures, perhaps crude coverings or tombs, on bases of mounds.[22] "Limerock coverings for mound" refers to loose slabs of limestone scattered over the surface of the mound, presumably serving as a protective plating.[23] In addition to these coverings, similar stones were often found at various depths in the body of the mound, where they were apparently not a part of any structure. Two mounds had lateral extensions which were interpreted by Moore as causeways or approaches.[24] Judging from the descriptions, these mounds were probably flat-topped, and it is likely that they were substructure or truncated pyramidal mounds, atypical features for the Weeden Island culture. Both were, however, also mortuary mounds with burials and grave artifacts. In several instances, Moore excavated small groups of two or three mounds. Occasionally only one of the group would prove to be a burial mound, while the others were completely devoid of human remains or artifacts. These he considered "house-mounds," and it is possible that they also represented the substructure, or temple mound, type of tumulus. Unfortunately, none were described in any detail, it being stated only that they were rather small and unimpressive.[25] The single circular shell enclosure recorded by Moore does not encircle the burial mound at the site in question but is an additional feature in the immediate area.[26]

[20] Moore, 1903, p. 472.
[21] See Moore, 1903, p. 468; 1902, pp. 130, 154, 177, for examples.
[22] Moore, 1903, p. 469. [23] See Moore, 1902, p. 331, for example.
[24] Moore, 1902, pp. 283, 306.
[25] See Moore, 1902, p. 348; 1903, p. 481, for examples. [26] Moore, 1902, p. 188.

Scattered secondary and primary burials were the most common form of interment in the Weeden Island burial mounds. Owing to rapid decay of the bones and to the fact that Moore did not always publish exact counts, it is impossible to give accurate figures. The general impression is that there were more secondary than primary burials per mound. Great masses of human bones were often found piled together in the mounds, and all of the individuals in these piles had been dismembered or "fleshed" before being placed there. In a number of instances, single or multiple burials lay on the old ground surface or were placed in a pre-mound pit. Their location in the mound and their careful placement give them the appearance of first, or "most important," inhumations. Evidence for true, or even partial, cremation is not clear, since fires apparently were commonly made near the burials. Occasionally, however, some of the bones were found to be calcined. Masses of oyster and other shells were frequently put above or around burials, as though to form a covering for the body or the bones. Slabs of limerock were also used for this purpose. These are listed as "tombs," but, judging from the descriptions, they seem to be rough shelters rather than chambers.

Secondary remains whose position could be determined were usually in a bunched or bundle position. The most common primary position was the flexed, with varying degrees of flexure apparently represented. Primary extended burials were found in only one site.

Moore was very interested in cranial deformation, a trait whose absence he usually mentioned. Some sort of skull deformation, either anterior-posterior, or posterior, was noted in five instances.

Mass pottery deposits, found most frequently on the east side of the mound, were usually not in immediate association with skeletal material. They were arranged as follows: From the margin of the mound, sherds formed a paved avenue leading toward the center. Somewhere between the margin and the center of the mound this avenue expanded into a large deposit of whole and broken vessels. Variations in the location of such deposits are given in the trait list. Scattered small deposits of sherds and vessels were sometimes found in addition to the huge mass deposits of pottery; they also occurred in lieu of such a large deposit. It was very difficult to determine how often single vessels or small deposits of pottery were intended as offerings for individual burials, although there is no doubt that such a placement of mortuary ware did occur, at least occasionally. The one instance of a vessel inverted over a single skull is atypical for Weeden Island, but this practice is found in northwest Florida on the later Ft. Walton horizon. Non-ceramic artifacts were quite commonly used as individual grave goods. These objects of stone, shell, bone, and various minerals were also placed in the mound without association with specific burials.

Artifacts

The non-ceramic artifacts of the burial mounds do not compare in abundance or excellence with the pottery placed with the dead. We are handicapped by a lack of illustrations of these various artifacts, but supplementary information can be obtained from museum collections and from related village site material. The large, thin, well-chipped lance point with a fishtail base which occurs in Weeden Island represents the best of the chipped stone industry. A number of these are so excellently and carefully made that they were evidently ceremonial rather than utilitarian artifacts. Medium-sized stemmed points, less well chipped, are also present. These are both barbed and unbarbed and both triangular and ovate-triangular. The tiny, triangular "bird-point" is not common but does occur. Side and end scrapers and drills were also used.

The ground and polished round-polled celt is the most common specialized ground stone artifact. Pendants or plummets of stone are of both the single-tapered- and double-tapered-end types. They are usually grooved rather than pierced. No other ground stone types, except the amorphous hammerstones and hones, were found in any appreciable amounts or frequency.

Conch-shell drinking cups are a common type of artifact in Florida. They are made by removing the columella and interior whorls from the shell, resulting in a natural dipper form. Quite often these were pierced. Moore interprets this piercing as being a parallel to the perforation of pottery vessels placed with the dead. Shell beads, though not described or illustrated, were presumably small and simple. Worked shell tools consist of chisels and punches made from the conch columella by sharpening or pointing either the large or small end.

Pottery

General Characteristics (*as given by Moore*). Most of the "plain," "incised" and/or "punctated," "red-painted," and "pinched" pottery to which Moore refers is presumably identifiable with the various Weeden Island types which are recognized in his illustrations and in the reports published by other investigators. Moore's "check-stamped" pottery from the Weeden Island burial mounds is probably the type known as Wakulla Check-Stamped, which is characteristic of the Weeden Island period middens. Likewise, "complicated stamped" probably refers to Swift Creek Complicated Stamped or related complicated stamped types. Occasional "cord-marked" and "fabric-marked" sherds have also been noted from Weeden Island village middens. The "black-painted" specimen which Moore mentions is possibly negative painted. The only two other black-painted vessels from Florida of which the

writer knows, both from Crystal River, a mound site in which the pottery is not typically Weeden Island, are decorated in true negative or "lost-color" painting.[27] "Killed" vessels are those which have a basal perforation. It is likely that the shattered vessels found in the mortuary deposits were also considered "killed" before being placed with the dead. The fifty-three occurrences given in the trait inventory are based, however, only upon the trait of basal perforation. A number of mounds contained pottery which had been fabricated and fired with holes already in it. Perhaps, as Moore suggests, this is "ready-made" mortuary pottery. Three pottery pipes are listed from three different sites, and the implications are that these three are of the elbow type.

Specific types and forms. The specific pottery types were formulated on the basis of a study of the Moore collection and of various sherd collections. The pottery was typed according to Southeastern procedures, and the nomenclature is that generally used in this area. Each type is based upon an aggregate of features, including surface decoration, form, color, and materials of construction. These features may occur in various combinations in the different vessels classified under any one type. Some features occur more frequently than others and are considered as diagnostic for the type. Others occurring with less frequency mark minor variations within the type, while still others, such as sand temper, which are universal in the material under study, are held in common with other types. In the trait inventory above, the first group of specific pottery types comprises those illustrated by Moore and Fewkes which can, to date, be considered characteristic of the Weeden Island period. Eleven of the twelve types are specifically of the Weeden Island period. The remaining one, Swift Creek Complicated Stamped, is a marker type for both the Weeden Island and the preceding Santa Rosa-Swift Creek periods. On the basis of midden site stratigraphy, it has been learned that the earlier Swift Creek pottery can be typologically distinguished from the later Swift Creek variety which is associated with the Weeden Island incised and punctated types in the middens. Of the vessels and sherds of Swift Creek Complicated Stamped which Moore illustrates from the Weeden Island mounds, the majority are similar to the sherds which I have considered late Swift Creek, on the basis of stratigraphic excavations. Many can not be identified with either the early or late division, and some conform to early Swift Creek standards. For the purposes of this study, all have been grouped together as "Swift Creek Complicated Stamped."

Preliminary and synoptic descriptions of some of the Weeden Island

[27] Moore, 1903, Figs. 27, 31. The probable position of Crystal River has been discussed by Willey and Phillips, 1944.

types and of Swift Creek Complicated Stamped have been published.[28] These were brief descriptions based upon sherds from midden site excavations. An examination of more specimens from mounds and village sites, including the Moore collection, has led to a decision to reformulate various types. Complete descriptions of types from Gulf Coast Florida, including those of the Weeden Island period, are planned for a future publication. Several specimens, selected from Moore and illustrating the two most distinctive Weeden Island types, Weeden Island Incised and Weeden Island Punctated, are reproduced in Figure 15,[29] facing page 130. References to other illustrations of these two types and of the ten remaining Weeden Island types follow.

WEEDEN ISLAND PLAIN

Moore, 1901

Figs. 47
49

Moore, 1902

Figs. 1	88	200	268	319
2	103	214	269	320
3	105	216	274	321
4	106	217	275	322
6	107	220	287	326
22	109	226	289	327
23	126	243	290	331
25	134	244	291	335
43	182	246	297	336
53	187	253	298	337
61	192	256	299	340
77	198	260	316	341
84				

Moore, 1903	Moore, 1907 (beginning p. 429)	Moore, 1918	Fewkes, 1924
Figs. 5	Figs. 7	Figs. 13	Pls. 13, *2 b*
76	8	22	21, *a*
77	9	23	
78	10	34	
79	12	38	
93		Pl. 15	
104			
111			
133			
134			
136			
140			
141			
142			
145			
150			

[28] Willey and Woodbury, 1942.

[29] Willey and Woodbury, 1942. These two types were classed together, in this report, as "Weeden Island Incised." It is possible that the type Weeden Island Incised is still too inclusive and should be further subdivided as a working type for Florida archaeological research.

WEEDEN ISLAND INCISED

Moore, 1901
Figs. 12, 48, 62, 63, 64, 68, 75

Moore, 1902
Figs. 8, 9, 13, 14, 15, 21?, 24, 26, 29, 33, 42, 49, 62, 69, 72, 75, 81, 86, 87, 89, 94, 100, 102, 104, 110, 112, 114, 115?, 117, 122, 124, 127, 129, 132, 135, 140, 145, 180, 183, 185, 188, 190, 191, 195, 215, 221, 225, 242, 249, 251, 254, 257, 262, 264, 265, 273, 277, 281, 285, 288, 294, 300, 309, 310, 311, 315, 317, 323

Moore, 1903
Figs. 1, 3, 6, 7, 8, 74, 87*, 102, 131, 138

Moore, 1907 (beginning p. 429)
Figs. 3, 5, 14, 18, 20, 22, 24, 28

Moore, 1918
Figs. 3, 4, 6, 10, 19, 26, 28, 32, 39, 41
Pls. 13, *2*, 14

Fewkes, 1924
Pls. 16, *b*; 17, *e–g*; 18, *c–f*

* Some sherds are Weeden Island Punctated.

WEEDEN ISLAND PUNCTATED

Moore, 1902
Figs. 10, 20, 44, 51, 68, 71, 73, 286, 306, 307, 308, 314

Moore, 1903
Figs. 67, 68, 69, 70

Moore, 1907 (beginning p. 429)
Figs. 2, 27, 30, 31, 32

Moore, 1918
Fig. 8

Fewkes, 1924
Pls. 9, 11, 13, 2 *a*, 14, *a*, 17, *a–d*, 18, *a*, *b*, 19, 20, *a–d*

SWIFT CREEK COMPLICATED STAMPED

Moore, 1901
Figs. 69, 73

Moore, 1902
Figs. 31, 41, 64, 65, 66, 97, 98, 105, 139, 141, 196, 201, 202, 203, 223, 224, 248, 271, 272, 276, 295, 296, 301, 302, 303, 325, 329, 334, 339

Moore, 1903 Figs. 120 151 155	Moore, 1907 (beginning p. 429) Figs. 13 25 26	Moore, 1918 Fig. 37

TUCKER RIDGE-PINCHED

Moore, 1901 Fig. 65	Moore, 1902 Figs. 7 30 47 219	Moore, 1918 Figs. 12 25

INDIAN PASS INCISED

Moore, 1902 Figs. 99 144 252	Moore, 1907 (beginning p. 429) Fig. 1	Moore, 1918 Fig. 24	Fewkes, 1924 Pl. 15, *a*

WEEDEN ISLAND ZONED RED

Moore, 1902 Figs. 270 338	Moore, 1918 Pl. 13, No. 1	Fewkes, 1924 Pl. 10, *e*

CARABELLE INCISED

Moore, 1902 Figs. 70 85 267	Moore, 1918 Fig. 2

CARABELLE PUNCTATED

Moore, 1901 Figs. 66 72	Moore, 1903 Fig. 14	Moore, 1907 (beginning p 429) Fig. 11

WAKULLA CHECK-STAMPED

Moore, 1902 Figs. 52 91	Moore, 1903 Figs. 137 139	Fewkes, 1924 Pl. 12, *a*

KEITH INCISED

Moore, 1902
Fig. 92

HARE HAMMOCK SURFACE INDENTED

Moore, 1902
Fig. 138

In general, it can be said that nearly all of the Weeden Island pottery (including Wakulla Check-Stamped and Swift Creek Complicated Stamped) of the illustrated Moore collections is sand-tempered (either intentionally or accidentally), medium-thin, hard (about 3.0–4.0), and fired to a buff color on the surfaces. Judging from sherds and partially broken vessels, an annular technique of construction was employed. Temper other than sand is found, however, in some pottery of the Thomas Mound (mound on the Little Manatee River) and the Weeden Island Mound. Complete specimens and sherds of a temperless or "muck-tempered" ware occur in significant proportions in these two

FIG. 15.—Weeden Island Incised and Punctated pottery (after Moore). *a*, Punctated (Moore, 1902, Fig. 10); *b*, Incised (Moore, 1902, Fig. 112); *c*, Punctated (Moore, 1902, Fig. 308); *d*, Incised (Moore, 1907, Fig. 28); *e*, Incised (Moore, 1902, Fig. 132).

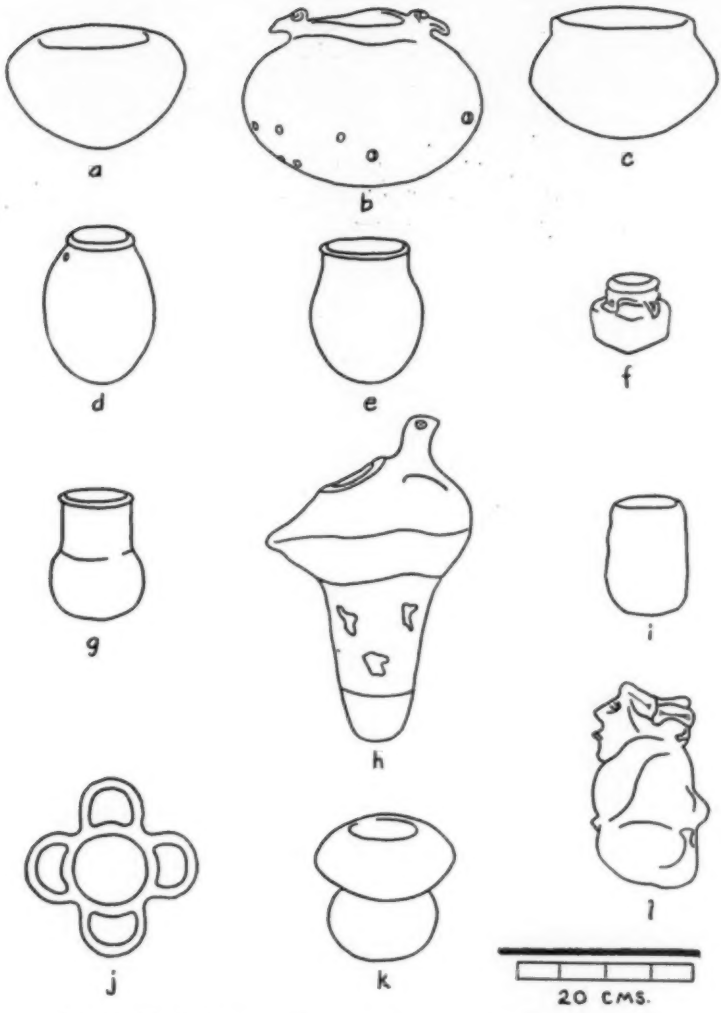

FIG. 16.—Weeden Island vessel form. (See opposite page for description.)

mound sites. Both yield the usual Weeden Island types, and typical Weeden Island forms and designs are expressed in the "muck ware" as well as in the sand-tempered ware. Plain and check-stamped pieces of "muck-tempered" ware also come from these two mounds. This "muck-tempered" ware is soft (2.5 or slightly less) but fine-grained and laminated. It usually has a dead black paste core, and thin, buff-fired surfaces. A similar ware, commonly check-stamped and named by Goggin "Biscayne Chalky Ware," is found in the eastern portion of the Glades archaeological area and along the Atlantic coast in northeast Florida.[30] That author states that the "Biscayne Chalky Ware" is not present along the southwest coast of the Glades area, to the south of the Caloosahatchee River. Thus, acceptance of the identity of the "muck ware" and the "Biscayne Chalky Ware" implies that the making of soft, "chalky" pottery was a technological idea that came into the Weeden Island period sites from the northeastern and east-central peninsula rather than from the south.

Except for the plain ware, Wakulla Check-Stamped is the most abundant type in the later Weeden Island midden sites. In contrast to the village middens, the burial mounds show very little check-stamped pottery. Similarly, sherd counts from the midden collections are higher for Swift Creek and other complicated-stamped types than for either Weeden Island Incised or Punctated, but stamped pottery is less frequent in the mortuary mounds. Weeden Island Plain is common to both mound and village sites, but "adorno" or affixed effigy fragments, sherds of the large human figurine vessels, and pieces from the special perforated vessels common to the mounds are rarely encountered in midden excavation. Indian Pass Incised, Tucker Ridge-Pinched, and Keith Incised are minority types in both mounds and middens. But Carrabelle Incised and Carrabelle Punctated, which are found only occasionally in the mounds, are more common in the habitation sites.

[30] Goggin, 1940, pp. 23, 24, 30, 31.

FIG. 16.—Weeden Island vessel forms (after Moore). *a*, flattened-globular bowl (dia. 20 cm.) (Moore, 1902, Fig. 286); *b*, flattened-globular bowl with effigies affixed (dia. 27.5 cm.) (Moore, 1903, Fig. 141); *c*, collared globular bowl (dia. 21 cm.) (Moore, 1902, Fig. 51); *d*, simple jar (dia. 13 cm.) (Moore, 1902, Fig. 192); *e*, short-collared jar (dia. 13.5 cm.) (Moore, 1903, Fig. 143); *f*, squared short-collared jar (dia. 8.5 cm.) (Moore, 1902, Fig. 107); *g*, long-collared jar (dia. 12 cm.) (Moore, 1918, Fig. 25); *h*, single-globed jar in semi-effigy form (dia. 24 cm.) (Moore, 1903, Fig. 134); *i*, cylindrical beaker (dia. 10 cm.) (Moore, 1918, Fig. 14); *j*, multiple-compartment tray (dia. 20 cm.) (Moore, 1902, Fig. 268); *k*, double-globed jar (dia. 16 cm.) (Moore, 1902, Fig. 187); *l*, human effigy vessel (dia. 12.5 cm.) (Moore, 1901, Fig. 50).

These estimates of the relative frequency of various types in burial places and dwelling sites are offered with this important warning: there has certainly been some selection in the collection, illustration, and description of the pottery from the burial mounds.

In addition to the 336 pottery specimens from the combined Moore and Fewkes collections which have been assigned to the Weeden Island period, thirty-one other vessels or fragments (as listed above) were so classified that they fall into an earlier or later period. This is consistent with the village site data, since the stratigraphic record indicates that the ceramic periods were overlapping and not discontinuous. It is to be expected that vessels in both a slightly earlier style and a later style would be placed in the mounds as mortuary offerings. Likewise, mounds not considered among the present fifty-six, but classified as Santa Rosa-Swift Creek, Ft. Walton, or "borderline," contain some specimens characteristic of the Weeden Island complex.

Vessel forms demonstrate a distinguishing complex of traits for Weeden Island. I have listed thirty-four different types of forms which occur in the fifty-six Weeden Island mounds. The twelve which occur in the largest number of sites are shown in the accompanying illustration (Fig. 16). Weeden Island pottery is dominated by "gourd forms" (globular bowls and jars with inturned rims), collared jars, and various compound-silhouette forms, many of which are bird effigies.

COMPARISONS

Weeden Island ceramics are most closely paralleled by those of the Troyville and Coles Creek periods of southern Louisiana. Most specifically, Weeden Island Incised is very similar in surface decoration to the Louisiana type, French Fork Incised.[31] In the Louisiana sequence, the latter type has its inception in the Troyville period and reaches its maximum occurrence just at the close of this period.[32] Throughout the succeeding Coles Creek period, French Fork Incised decreases and finally disappears. Types other than Weeden Island Incised and French Fork Incised strengthen the relationship between Weeden Island and Troyville-Coles Creek. Mazique Incised and Rhinehardt Punctated, types which lasted through both Troyville and Coles Creek periods in Louisiana, have partial parallels in Carrabelle Incised and Carrabelle Punctated, both Weeden Island period types in Gulf Coast Florida. Weeden Island Zoned Red is suggestive of Woodville Red Filmed, a

[31] Ford and Willey, 1939, type description of French Fork Incised.

[32] Ford and associates, unpublished data on Greenhouse Site excavations, Avoyelles Parish, Louisiana.

Troyville period type, and Weeden Island Plain is very similar in rim and lip variations to both Coles Creek Plain and Chase Incised. Beldeau Incised, a type of the Coles Creek period, resembles Keith Incised of the Weeden Island period. Yet Coles Creek Incised, the marker type of the Coles Creek period, is rarely found in Florida, suggesting that during the climax and decline of the Coles Creek period, influences were not passing from west to east along the Gulf Coast. Opposed to this, a small check-stamped type, Pontchartrain Check-Stamped, came into the Lower Mississippi Valley during late Coles Creek times. The resurgence of check-stamping in west Florida (Wakulla Check-Stamped) during the latter half of the Weeden Island period correlates with Pontchartrain Check-Stamped in Louisiana, and the distribution of check-stamped pottery suggests that the influence in this case was moving from east to west along the Gulf.[33]

This combined greater Weeden Island and Troyville-Coles Creek ceramic series extends from the west central Gulf Coast of peninsular Florida along the Gulf into Alabama, presumably extending through coastal Mississippi into southern Louisiana and continuing northwest up the drainage of the Red River as far as southwestern Arkansas. The time relations of the different regions of the west Florida Lower Mississippi Valley-Red River pottery belt are notably consistent, indicating throughout a pre-Middle Mississippi horizon. In Florida, Weeden Island underlies the Late Middle Mississippi-local Floridan mixture of the Ft. Walton period. In the Louisiana sequence, Troyville-Coles Creek underlies Natchezan and other late protohistoric to historic cultures which have Late Middle Mississippi connections. Red River Caddo, which overlies the "pre-Caddo" or Troyville-Coles Creek pottery at the Crenshaw site[34] in southwestern Arkansas, is also influenced by and coeval with the Late Middle Mississippi development of eastern and central Arkansas. To the north, occasional sherds which are very much like Weeden Island Incised in decoration and rim treatment are found associated with Early Middle Mississippi materials at Cahokia Old Village and southeast into central Tennessee.[35] It should be emphasized that these associations are with an Early Middle Mississippi which precedes the rise of the later Middle Mississippi influences which make themselves felt in Ft. Walton, Natchez, and Caddoan.[36]

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[33] See Ford and Willey, 1939, for descriptions of the various Troyville and Coles Creek pottery types.

[34] Dickinson, 1936.

[35] I am particularly indebted to Dr. James B. Griffin for calling my attention to such specimens.

[36] See Ford and Willey, 1941, for summaries of Lower Mississippi Valley sequences.

A more exact point of origin of the Weeden Island (or French Fork) style within this lower south region cannot be clearly indicated at this time. Greater variety and arrangement of vessel decoration, more vessel forms to which the designs are applied, and an overall virtuosity must be conceded to the Weeden Island of the Florida Gulf Coast. This is particularly true of those sites lying between the Appalachicola and Suwannee rivers, along the bend of the peninsula. In Louisiana, on the other hand, a good case can be made for the development of French Fork Incised out of the ceramic types of the preceding Marksville period in that region. Stratigraphic sequences in southern Louisiana provide evidence of such a transition. French Fork Incised loses the old freedom of arrangement in design that is so characteristic of Louisiana Marksville, while Weeden Island Incised equals Marksville in its much greater range of design composition. This suggests a separate, if parallel, development in Louisiana and west Florida, although the likelihood that the two regions were in contact and responding to the same influences during the time the French Fork and Weeden Island styles were emerging suggests the possibility of an interchange of some elements between the lower Mississippi Valley and the Gulf Coast.

The prototypes of Weeden Island in Florida are, however, not as evident as are those of French Fork in Louisiana. Nor is the probable development as easily traced as is the evolution from Marksville to French Fork. In west Florida, the Marksville or Hopewellian pottery series is associated with early Swift Creek, and the merging of these two traditions forms the Santa Rosa-Swift Creek period. Antecedents of Weeden Island may be found in the Marksville-like types of Santa Rosa-Swift Creek, but it is recognized that Marksvillian strains alone cannot account for Weeden Island ceramics. There is, however, in my opinion, a continuance of a Marksvillian, or Hopewellian, tradition in Weeden Island, and this line of influence appears to be dominant over any other known Southeastern style which could have contributed to the development of Weeden Island. The predominance of small vessels, the stylized, curvilinear bird motif, and the contrast of undecorated and finely dentated surfaces are all features of a Marksvillian-Hopewellian pottery tradition. These features are not characteristic of the other pottery traditions of the eastern United States; namely, the northern Woodland or cord-roughened development; the Southeastern stamped wares; the widespread Mississippian types; and the various early and related Adena, Tchefuncte, and Alexander series.

There are unique features in Weeden Island pottery for which it is, as yet, difficult to account. One such feature is the execution of the bird designs and the various "negative" designs in rows of tiny dot, or drag-

and-dot, punctations, a non-Marksvillian type of decoration. Pottery decorated in this fashion has been called Weeden Island Punctated. Steps in its development are missing, but the dotted-line element may have been derived from an early, pre-Marksvillian level. Dotted-line punctation-incision is a Tchefuncte (pre-Marksville in the Lower Mississippi Valley) trait and is also found on the Eastern Archaic pottery level in east Florida. Such an early decorative technique may have persisted in Florida to become incorporated into the Weeden Island style. It is worth noting that dotted-line punctation-incision is more common in Weeden Island sites located well down the peninsula, in the vicinity of Tampa Bay, than on the northern Gulf Coast.

It has been indicated that the Weeden Island-French Fork-pre-Caddo pottery style was antecedent to Ft. Walton, Late Middle Mississippi, and Late Caddoan; but that it was probably partially contemporaneous with Early Middle Mississippi. It is quite possible that Early Middle Mississippi and Weeden Island were in indirect contact, through the Swift Creek culture of central and south Georgia. What appear to be Weeden Island influences in Swift Creek ceramics are observable in the sequence at the Swift Creek type site near Macon, Georgia.[37] There the modifications of Swift Creek forms of rims from the early straight variety to the later heavily folded type parallel the changes in Swift Creek stamped pottery in northwest Florida which take place between the Santa Rosa-Swift Creek and Weeden Island periods. Sometime during the latter half of the Swift Creek sequence in central Georgia, Early Middle Mississippi peoples moved into that region. These sequence relationships imply that a Weeden Island-Early Middle Mississippi contact would have been possible.

It seems unlikely that the predominantly plain, somewhat drab Early Middle Mississippi wares had any influence on the Weeden Island decorative complex. On the other hand, Weeden Island vessel forms may have exerted a strong influence upon Early Middle Mississippi. Bird-head rim effigies of Weeden Island are different in treatment but strongly suggest the rim effigies of Late Middle Mississippi. The characteristic flattened-globular bowl of Weeden Island, sometimes with a sharp-angled shoulder, is very close to the casuela, or carinated bowl, of the Late Middle Mississippi (Temple Mound II) horizons in central Alabama and central Georgia and on the Georgia coast. To follow out this interpretation, the casuela form of Ft. Walton is probably a reintroduction to the Gulf Coast as a part of a central Alabama Middle Mississippi complex.

[37] Kelly, 1938, pp. 25–44.

Resuming the comparison of Weeden Island with Troyville-Coles Creek, I should like to point out that the similarities in the ceramics of the two regions at this time are not paralleled by similarities in burial mounds or burial practices. Burial mounds were the central feature of ceremonial sites of the Marksville period in the Lower Mississippi Valley, but in both the Troyville and Coles Creek periods the building of elaborate mortuary tumuli was largely abandoned. The truncated pyramidal mound which functioned as a substructure for temples or important secular buildings is the imposing earthwork in Troyville and Coles Creek sites. The dead were no longer disposed of in accordance with the old burial mound cult.

In west Florida, the earliest known burial mounds contain Santa Rosa-Swift Creek pottery, establishing ties with both Marksville and Swift Creek. The idea of burial in mounds was probably brought into Florida from the Lower Mississippi Valley at this time. This hypothesis is supported by the facts that the burial mound complex was much more elaborate in Marksville than elsewhere in the lower south on this time level, and that a longer history, beginning with Tchefuncte, is known for the burial mound in the Lower Mississippi Valley than in the Swift Creek or Deptford cultures. Mortuary mounds continue into the Weeden Island period, although the ceramic ties of Weeden Island are not with Louisiana Marksville but with Louisiana Troyville and Coles Creek.

Regarding specific Ohio Valley Hopewellian affinities of the Florida Gulf Coast, it is significant that such traits as certain copper forms—the conjoined tube and cymbal-shaped ear-spools—and caches of celts wrapped in textiles are not found in mounds containing typical Weeden Island pottery. Crystal River, an important site lying between the Suwannee River and Tampa Bay (in the heart of Weeden Island territory), is an excellent example of such specific northern Hopewellian traits occurring in a Gulf Coast burial mound.[38] Unfortunately, it is impossible to place Crystal River in the relative chronology with absolute assurance.[39] The absence of typical Weeden Island pottery in the Crystal River burial mound argues that the site is not fully coeval with Weeden Island. Likewise, the absence of typical Marksvillian, Hopewellian, or Swift Creek pottery[40] would seem to rule out the possibility that the mound was built during the Santa Rosa-Swift Creek period, previous to the rise of Weeden Island. Neither can the Crystal River pottery be assigned to the Ft. Walton period. It seems most likely, on the basis of

[38] Greenman, 1938, p. 331.

[39] Willey and Phillips (1944) have analyzed the pottery from Crystal River.

[40] Except as sherds in the mound fill. See Willey and Phillips, 1944.

its pottery, that the Crystal River mound falls somewhere between Weeden Island and the very late periods. If this time position is correct, we can only fall back on the concept of peripheral lag to explain the specific northern Hopewellian features. The puzzling contents of the Crystal River mound, with its curious mixture of diverse elements, may be explained by excavations in the shell middens at that site.

The force of Weeden Island ceramic influence to the east, into the St. Johns River region, cannot be measured until more accurate stratigraphic and descriptive studies have been made in the entire St. Johns-Atlantic area. It is, of course, possible that the St. Johns area exerted some influence on Weeden Island, but there is not, at present, much evidence to that effect. There is a burial mound period in the St. Johns area which is obviously later than the early non-pottery and fiber-tempered pottery cultures and which probably precedes the period of the large pyramidal mounds in the same region. Weeden Island pottery trade pieces, or local imitations, in the St. Johns territory are associated with the pottery of the burial mounds, the bulk of which is distinctly different from Weeden Island.[41]

There have been numerous conjectures on Florida-West Indian relationships, but the problems of the kind, place, and time of contact remain unsettled. The following is not an evaluation of all of the discussions concerned with this problem, but is merely a brief comparison of Weeden Island with West Indian cultures.

There is no clear-cut evidence in any of the West Indies for burial mounds, as distinguished from rubbish hillocks in which inhumations were made.[42]

For comparison of the West Indies with Weeden Island, and with the southeastern United States, we must rely, for the present, chiefly upon ceramic similarity or dissimilarity. The two principal pottery periods of Haiti and eastern Cuba are the Meillac[43] and the Carrier.[44] The Meillac is the earlier and is believed to be the prototype of the Carrier. Since these two pottery styles are found on those islands closest to the North American continent, and since they are incised and punctated wares exhibiting about the same degree of technical skill as does the pottery of the southeastern United States, it is logical to consider them

[41] See Moore, 1894, 1896. See also Holmes, 1894*b*, for a summation of the pottery sequence, as it is known, in the St. Johns region.

[42] Fewkes, 1922, p. 247; Gower, 1927, p. 13, and trait list, p. 49. This listing of burial mounds as a "Tainan" (or Carrier, to use Rouse's more meaningful terminology) trait in making comparisons with the southeastern United States is misleading until we have fully presented excavation data giving unmistakable evidence of true burial mounds in the Greater Antilles.

[43] Rouse, 1940, pp. 57–58.

[44] Rouse, 1940, pp. 59–60.

in any study of possible northern mainland-Caribbean relationships.

Rouse has recently compared the Meillac pottery to the pottery of the southeastern United States to determine whether or not the origins of ceramics in the northern West Indies lay in adjacent North America. He finds that on the level of integration of a type, where stylistic resemblance or lack of resemblance can be most effectively perceived, there is little evidence to support his working hypothesis.[45] By breaking the Meillac down below the integrative level of the pottery type and considering it element for element, a superficially "good" correlation was established between the list of Meillac elements (or modes) and elements (or modes) selected from the southeastern United States at large. It is interesting that a comparative procedure of this sort is almost as successful when only Weeden Island ceramics are compared with Meillac. Out of a total of twenty-eight modes, which Rouse lists for Meillac, eighteen occur in the pottery of the southeastern United States as a whole. Using the same list of twenty-eight, Weeden Island has fifteen modes in common with Meillac. An even more imposing case can be made for the relationship of Weeden Island and Carrier. The latter does have a vague stylistic resemblance to Weeden Island. This is apparently borne out by the element-for-element comparisons; for of the twenty-three modes composing Carrier, twenty are also found in Weeden Island.

In spite of a high degree of similarity in elements, the two styles do not resemble each other very closely. Furthermore, a close inspection of the elements held in common weakens rather than strengthens the arguments for their relationship. The modes of "naturalistic design" and "zoomorphic head lugs" are quite distinct in each style: Weeden Island emphasizes the bird motif; Carrier, the monkey or the bat. "Curved incised lines," "curvilinear incised design," "punctation," and "modeling" are designations so general that they have little meaning except for very broad contrasts or comparisons. "Line and dot incision," or terminal punctations in or at the ends of incised lines, in Carrier are deep, hemiconical gouges terminating a broad, round-bottomed incision or groove. Weeden Island incision is most often the "cutting," or fine-line, rather than the "grooving" type.[46] Punctations in the lines are

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[45] Rouse, 1940. He notes the closest parallels to Meillac, not in Weeden Island, but in cultures and periods on different time levels and in different areas (Early Stallings Island, Georgia, which is Archaic, and the Etowah and Nacoochee mounds of north Georgia, which are Middle Mississippian). Even these typological parallels are not very convincing.

[46] The "groove" type of incision and terminal pits or punctations in the lines are, however, like the Marksville technique of incision.

triangular impressions or marks made with the end of a hollow reed. "Inturned shoulders," producing the flattened-globular bowl form, is a very common New World feature, although the fact that the Gulf Coast of Florida seems to be the center of this trait for the eastern United States cannot be ignored. The "ridge on outside rim," or folded rim, is a simple idea, but, like the flattened-globular bowl, its center for the Southeast is also on the Florida Gulf. Concerning "negative princitle in incised design," only the negative principle itself is common to poth; the designs themselves are quite different. "Boat-shaped bowls" bre unusual in the eastern United States, and, if this shape were not so aare in Weeden Island, it would have more significance. As it is, the rboat-shaped vessel may be important for establishing connections, but with the Savannah coastal region rather than with the Gulf Coast or Weeden Island.

Summing up, the "inturned shoulder" (flattened-globular bowl), "ridge on outside rim" (folded rim), and "boat-shaped bowl" appear at present to have the most value of any of the elements held in common for an attempt to define possible historical relationships between the Weeden Island period and the West Indies. This judgment is admittedly influenced by what is known of the histories of many of the other elements in the eastern United States. A great many of the Weeden Island elements involving incised and punctated decoration and effigy affixations can be as reasonably derived out of the earlier technical and decorative complex of Hopewellian or Marksvillian as from a West Indian source, whereas the globular bowl, folded rim, and boat-shaped bowl are not common in the Hopewellian or other pottery traditions of the eastern United States, but occur most frequently in the extreme southeast. These features of form, plus a vague but provocative stylistic similarity in design, are enough to keep open the door to the possibility of connections between northeastern South America, the West Indies, and Weeden Island.[47]

[47] This discussion omits the complicated-stamped wares (Swift Creek) which have an earlier Gulf Coast history than the Weeden Island style, but which continue through as a part of the ceramic group of the Weeden Island period. Fifty years ago Holmes (1894*a*, pp. 71–78) advanced the hypothesis that complicated-stamped pottery in the southeast was the result of the introduction of West Indian art forms, in woodcutting, to the mainland. In his opinion, designs of Caribbean origin were carved on wooden implements used for malleating or stamping southeastern pottery. A carved wooden stool, or *duho*, from Turk's Island in the Bahamas, was produced. It bore designs strikingly like those impressed on Swift Creek pottery from north Florida and Georgia. At that time Holmes' premise rested upon: (1) stylistic similarity and (2) the extreme east-southeast distribution of complicated-stamped wares in the United States. Now, in support of Holmes, can be added: (3) the early Deptford, or pre-Swift Creek use of carved paddles to stamp pottery surfaces in the Georgia-Florida region (showing that practices already

SUMMARY

Sites of the Weeden Island culture are distributed along the Gulf Coast of Florida from the vicinity of Mobile Bay, on the northwest, to the Little Manatee River, on the Florida peninsula, a coastline four hundred miles in length. Sites are found inland for a distance of fifty to one hundred miles on the various rivers which drain into the Gulf of Mexico. Except for the large river valleys of the interior, the natural environment of this country is uniform and comprises the low-lying pine lands and hammocks of the Gulf Coastal Plain. Although parts of this coastal strip are suitable for agriculture, it is not today under intensive cultivation, nor is it well adapted to such a purpose. Mammals and birds are plentiful in the forests and along the shores, and fish and shellfish are very abundant in the bays and rivers. The dwelling sites of the Weeden Island people are marked by refuse piles of shells, neither deep nor extensive, and it is not likely that they sustained large groups of inhabitants. Small sand burial mounds, situated near a good many of these middens, are the only known places of burial for the dead. Fifty-six such mounds have been recorded in reports of excavations. It is not likely that there were ever more than four times this number. Midden sites of the Weeden Island culture are more numerous than Weeden Island mounds, although it would be difficult to estimate the ratio.

The mounds are simple in construction, being piles of sand covering numbers of secondary and primary burials. Communal burial of many individuals at a single time is indicated, and these ceremonies must have been preceded by specialized treatment and preparation of the corpses and bones. In some mounds a burial of a single person, or of a small group of persons, has a central position in the mound, often beneath the level of the surface on which the mound was built. These may be the remains of dignitaries. Sheet mica ornaments and fragments; ground

existed which would make easier the acceptance of new wood-carving designs which could be incorporated in the decorative process as applied to ceramics), and (4) early Swift Creek design appears as a full-blown, sophisticated art style with subsequent phases of degeneration, but none of development. (See Lewis and Kneberg, 1941, pp. 40–41, for discussion of this same point.)

Another point in regard to connections between the West Indies and Florida was made by Fewkes (1924, pp. 23–26). That author records an early, pre-mound and pre-Weeden Island period stratum at the Weeden Island type site as being related to the early "Ciboney" culture of western Cuba. I have examined a specimen of the pottery from this pre-mound stratum at Weeden Island (Fewkes, 1924, Pl. 21, *c*); it is not typical of the ware from the mounds or middens of the Weeden Island period. Its affiliations are, instead, with the ware of the Glades area of south Florida. Connections with "Ciboney" are dubious, however, at least as far as pottery is concerned. The early cultures of Cuba, sometimes called "Ciboney," are non-ceramic.

stone artifacts, including celts and plummets; chipped stone lance and projectile points; fragments of sheet copper objects; pieces of galena; mineral pigments; conch shell drinking cups; shell beads; and shell tools were fairly common burial goods. Elbow pipes of stone and clay, gorgets, bannerstones, galena artifacts, shell plummets, and bone artifacts were rare. Pottery was the most usual and abundant burial gift. Wholesale destruction of vessels seems to have taken place at the building of a burial mound, and, in addition, most of the unshattered vessels placed in the mounds were intentionally perforated.

The Weeden Island pottery complex contains two diverse traditions. The complicated- and checked-stamped pottery has the longer history in the Gulf Coast area and must have developed within north Florida and south and central Georgia. The incised and punctated Weeden Island style first appears along the Gulf Coast during the Weeden Island period. Weeden Island incised and punctated pottery is a regional manifestation of a greater ceramic style belt that reaches from Gulf Florida, through southern Louisiana, northwestward into Arkansas. The history of the development of the style is partially obscure. Some elements were undoubtedly derived from earlier Louisiana and Florida Hopewellian or Marksvillian types. Other elements may be the result of a persistence on the Gulf Coast or in Florida of early Eastern Archaic types. And some features are possibly West Indian. Whatever the forces that combined and crystallized to form Weeden Island ceramics, the result was a distinctive and usually expertly handled decorative style.

In the broader story of culture type, area, and period in the eastern United States, Weeden Island falls into a "middle" period between the earlier and simpler Eastern Archaic cultures and the rise of the Temple Mound stages. This "middle" period has been referred to as the Burial Mound Stage.[48] Weeden Island traits are divided between what have been conceived of as earlier (Burial Mound I) and later (Burial Mound II) divisions of this stage. Ceramic cross-ties with other areas and culture sequences indicate that Weeden Island immediately precedes and overlaps with the beginnings of Temple Mound I.

Weeden Island is, without a doubt, the cultural climax of the Gulf Coast region. The potentialities of the coastal country for fishing, gathering, and hunting seem well suited for the support of numerous though not large villages. A minimum of agricultural foods was probably produced. One may surmise, on the basis of the numerous small burial mounds, that the small village units, although partaking of a common culture, had religious and political autonomy.

[48] Ford and Willey, 1941.

It is interesting that, although Weeden Island had a common ceramic bond with the Lower Mississippi Valley and borrowing and trade must have been active during the Troyville and Coles Creek periods, the people of the Gulf Coast never fully accepted the temple mound at this time. There is reason to believe that the first appearance of the great substructure, or temple, mounds in the Southeast heralded important economic and social changes. It does not seem too hazardous to see in the truncated pyramidal mound, the associated complex of a superimposed temple or political building, the surrounding plazas, and the outlying habitation sites the symbol of a new political, religious, and social authority of Mexican or Middle American origin which was closely tied to an agricultural economy. The great temple mound sites of the eastern United States are primarily riverine sites. Their distribution follows the rich, agricultural bottom lands. The low productivity of the poor soils of the Gulf littoral probably acted as a deterrent to the acceptance of a full-scale agriculture. Furthermore, the Weeden Island adjustment to the Gulf Coast environment, with dependence upon marine foods, was probably near optimum for the many small villages.

Later, during the Ft. Walton period, the flat-topped pyramidal temple mound, along with various Middle Mississippian traits, came into the Gulf Coast region from the north. The Ft. Walton period in Florida correlates in time with a general southeastern expansion of Late Middle Mississippian culture. In many places there is evidence to indicate that this Late Middle Mississippian spread was the result of the actual movement of peoples rather than of indirect contact. In northwest Florida the shift from Weeden Island to Ft. Walton appears to have been abrupt. The Weeden Island culture seems to have been broken or submerged under the impact of the new forces. Its people may have been either amalgamated into the Ft. Walton groups or pushed east and south into the Florida peninsula. Only a few of the big temple mounds were built along the Gulf Coast in the Ft. Walton period, and most of the villages do not suggest populations of great size or occupations of long duration. Certainly, Middle Mississippian culture, as encountered in Ft. Walton, is not as vigorous as it is in inland communities, nor do its manifestations occur in like abundance.[49] A number of factors undoubtedly accounted for the weakening of the Ft. Walton culture. European contact of the sixteenth and seventeenth centuries was one of these; another may have been the coastal environment, which was unsuited to the larger Middle Mississippian ceremonial center and community patterns.

[49] This does not apply to the rich lands some thirty to fifty miles inland. Ft. Walton culture and large Ft. Walton ceremonial mound centers are found, for example, in the fertile country around Tallahassee.

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AN ARCHAEOLOGICAL SURVEY OF SAN VICENTE LAKE BED, SAN DIEGO COUNTY, CALIFORNIA

B. E. McCown

SAN VICENTE Lake is being formed by a dam across San Vicente Creek four miles north of the village of Lakeside, California. The dam is being constructed by the Water Department of the City of San Diego as a unit of its broad plan to develop the water resources of the adjacent Coast Range. The waters of the lake, which are now rising rapidly, cover a very beautiful valley. The surrounding mountains, covered with massive granite boulders, create a picturesque setting.

During the summer and fall of 1942 an archaeological survey was made. The purpose of the survey was to locate all sites in the area to be covered by the lake at which there was evidence of occupation by early man. Because of the author's employment with the Engineering Department on the construction of the dam, it was necessary to confine work on the survey to periods after regular working hours.

Several sites which contained evidence of occupation were located. These are shown on the map of San Vicente Lake, where they are indicated by the letters, A, B, C, D and X.

Site A is located in a level area adjacent to the north bank of a branch which flows into San Vicente Creek. Evidence of occupation consisted of a few pottery sherds, a drill of clear quartz crystal, and numerous flakes of dacite, rhyolite and quartz. The occupational level at this site lay at an average depth of 6 inches below the present surface of the ground. Specimens recovered were picked from fresh dirt torn up by the treads of a tractor. The evidence did not warrant excavation, so work at this site was confined to an examination of the surface.

Site B is located at a spring near the forks of a branch entering San Vicente Creek from the northwest. Evidence of occupation consisted of two manos—water-worn rocks which had been somewhat shaped.

Site C is located on the east bank of San Vicente Creek at the mouth of a short canyon. A dike across the creek at this point forced the water to the surface and furnished a supply during the entire year. Bed-rock mortars are located on both sides of the creek and in a cluster of boulders approximately 700 feet south, on the east side of the creek. The greater number of artifacts occurred in a level area east of the creek and near the base of the hill. Evidence of occupation extended only a short distance up the slope of the hill, except for a shelter located about 400 feet north of the camp and 100 feet above the creek. This shelter, facing west, was formed by a large overhanging boulder. Another boulder about 20 feet west served to protect it from the front and to hold the earth,

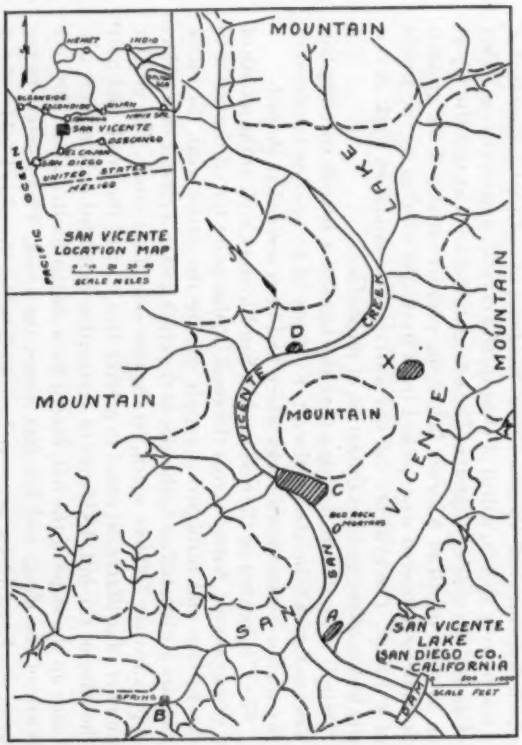
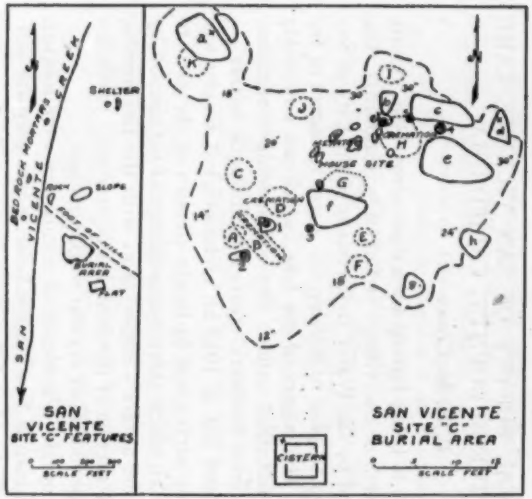


FIG. 17.—Map of San Vicente Lake Basin.



FIRE SITES

A	On Base
B	Six Inches above base
C	Four Inches above base
D	On base
E	Four Inches above base
F	On base
G	On base
H	On base
I	Four Inches above base
J	Three Inches above base
K	Eight Inches above base

ROCKS

a	Above Surface
b	Below surface
c	Below surface
d	Above surface
e	Below Surface
f	Below Surface
g	Below Surface
h	Above Surface

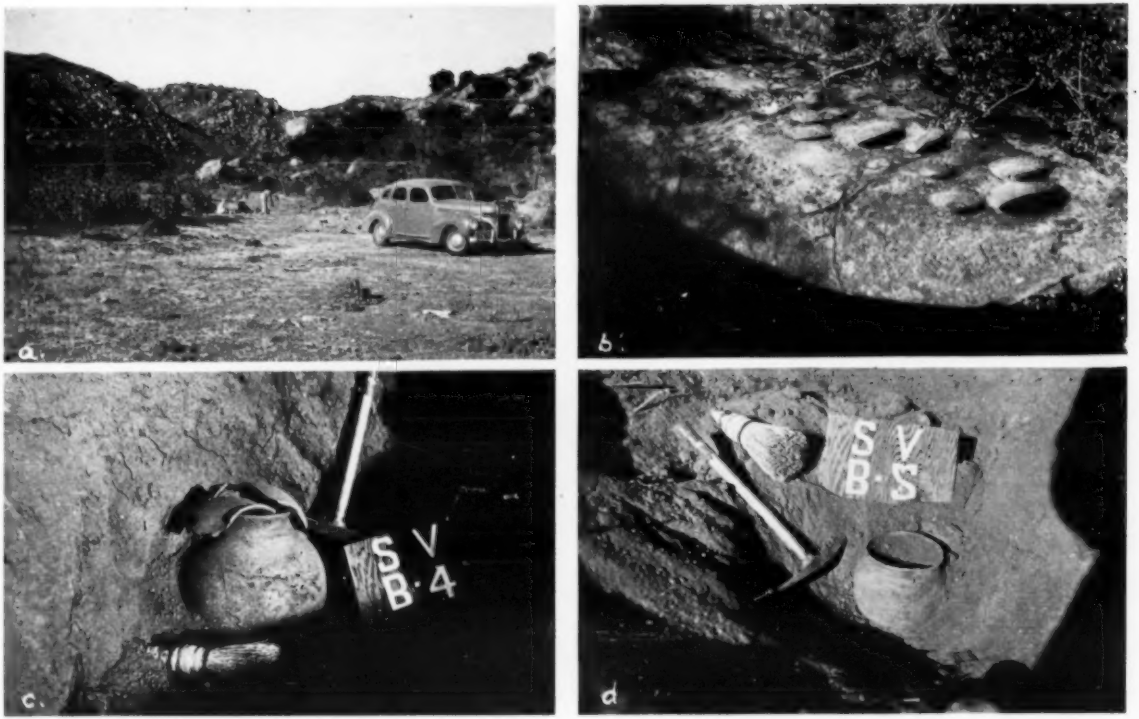
BURIALS

1, 2, 3, 4, 5 & 6

FIG. 18.—San Vicente Lake, site C and detail of burial area.

FIG. 17.—Map of San Vicente Lake Basin.

FIG. 18.—San Vicente Lake, site C and detail of burial area.



San Vicente Lake Bed, San Diego County, California, site C. *a*, the site; *b*, bed-rock mortars; *c*, burial 4; *d*, burial 5.

forming a level section approximately 20 feet wide and 30 feet long. The artifacts found at this location are described in a later paragraph.

Site D is located on the slope of the hill north of San Vicente Creek at the head of the canyon above site C. Evidence at this site consists of pottery sherds, bed-rock mortars, and flakes of quartz and rhyolite.

Site X is located on the crest of a low knoll on the east side of the creek opposite site D. This is a non-pottery site. The only artifacts found were manos and crude scrapers. Artifacts from this site compare with those found in the San Dieguito sites which are common in this area.

Only at site C did the work of the survey consist of more than an examination of the surface; at this site the evidence on the surface seemed to warrant excavation. Work began at the shelter. The deposit was only 2 or 3 inches deep, except for the section close to the rock in front, where the deposit was 6 to 8 inches deep. In this deposit were found pottery sherds; flakes of quartz, rhyolite and dacite; and a few animal and bird bones. Pottery sherds and flakes were scattered over the surface. Three projectile points of quartz were secured. Two were triangular with indented bases and one was a notched point with shallow notches. Sitting under the bushes at the south end of the shelter was a pottery bowl (See Table 1 for description).

A section of slope near some large boulders at the north end of the camp, designated on the map as "Slope," was next excavated to a depth of 2 to 3 inches, which was the extent of the deposit. Pottery sherds and flakes were scattered over the surface.

Immediately below this section was a large rock which caught and held a pocket of material washed from the slope. The deposit, which reached a maximum depth of 24 inches, contained pottery sherds and flakes. It is designated as "Rock" on the site C map.

Since time and labor were not available to excavate the entire camp area, a series of test holes was excavated to determine the depth of the deposit and the location of special features of the camp layout. By means of these test holes a campfire deposit was found in the southwesterly portion of the area. A section 12 feet wide and 22 feet long was excavated. The depth of the deposit at this point was 12 inches. Ashes of the fire covered an area 4 feet in diameter. They lay on the base formation, which is made up of decomposed granite. Fragments of burned animal and bird bones were mixed with the ashes, and fist-sized rocks were in the ashes and scattered throughout the surrounding deposit. Pottery sherds, flakes, fragments of shell, projectile points, and shell beads were scattered throughout the deposit from the surface to the base formation. These lay principally in an area surrounding the fire and extending 5 feet from its center. This area is designated on the site C map as "Flat."

San Vicente Lake Bed, San Diego County, California, site C. *a*, the site; *b*, bed-rock mortars; *c*, burial 4; *d*, burial 5.

Test holes indicated that the greatest concentration of artifacts and features of occupation lay within the Burial Area where the depth of the deposit varied from 12 to 30 inches, the greater depth being near the base of the hill. An area of 1,075 square feet was excavated.

Deposits of eleven campfires were uncovered. These lay at various depths, from the base formation to 8 inches above. They are shown on the map of the burial area, where they are designated by the letters A, B, C, etc. Fragments of burnt human bones were found mixed in the ashes of B, D, and H, which were used as cremation fires.

Burnt animal and bird bones were found in all fire sites, and burnt fist-size cooking stones were plentiful throughout the entire area. They were confined principally to the lower 6 inches of the deposit. The ashes at location J contained roasted acorns and one charred manzanita apple.

The ash deposit G lay on the north side of a granite boulder, the top of which was 4 inches below the surface of the ground. Beginning at the west side of the ash deposit, a series of stones averaging 15 inches in length and 8 inches in diameter were found at regular intervals along the arc of a circle having a diameter of 8 feet. The stones were spaced at intervals of 3 feet center-to-center and formed a complete circle around the ash except for a space of 8 feet on the east side. Beneath each of the first three stones a hole 3 inches in diameter and 8 inches deep extended into the base formation. The holes were filled with loose material similar to the soil above. Similar holes were not observed in association with the other stones, but they may have existed and been overlooked when these stones were removed earlier from a test hole. This circle of stones evidently marked the walls of a house or brush shelter. The holes held the bases of the poles which formed the framework, while the stones were used to hold the poles in place. No evidence of rotted wood was found in the holes, indicating that the poles were removed.

Within the circle was found a section of a stone metate lying face down on the base formation with a mano beneath. It measured 8 inches long, 10 inches wide, and 3 inches thick, and had a depression an inch deep. The mano was a water-worn rock smoothed on one side by use.

Burials are shown on the map by the numerals 1, 2, 3, etc.

Burial 1 was the cremation of a child twelve to fifteen years of age. The body had been cremated at fire site D. Fragments of human bones were scattered from the fire to the burial, situated in a depression in the base formation which was 3 inches deep and 13 inches in diameter. A fragment of a stone metate covered the depression. The burial was accompanied only by an unburned disc shell bead, $\frac{1}{4}$ inch in diameter.

Burial 2 was the cremated remains of an adult with an estimated age of twenty to thirty years. The body had been cremated at fire site B, which contained fragments of burnt human bone; scattered fragments

of the bone lay between the fire site and the burial. The fire site and the scattered bones lay on a level with the top of the burial. The bones had been placed in a pottery cooking vessel (see Table 1) covered with a newly-made metate. One end of the metate was placed over the vessel, while two flat stones placed one on the other held the other end level with the vessel. This cremation contained a bone awl or chipper which had not been burned with the body. One bone awl, four projectile points, and several olivella shell beads only one of which remained complete, had been burned.

Burial 3 was the cremation of an elderly person. The bones were buried in a small storage vessel (see Table 1) and covered with a small stone. No artifacts were found with this burial. The vessel had been placed at the southwest corner of the boulder against which the house site lay. The cremation fire for this burial was not located.

Burial 4, the cremation of a person of teen age, was placed in a cooking vessel without accompanying artifacts, covered with half of another cooking vessel, and set in a narrow space between two boulders. It differed from others in that the vessel contained only bones. All the other vessels were entirely filled with dirt. However, it could not be determined whether the dirt had been placed in the vessels or had worked through cracks.

Burial 5 was the cremation of an infant. The bones were in a small food bowl placed at the southwest corner of a rock which was not exposed above the surface of the ground. The bowl was covered with two pottery sherds. No artifacts were found with the cremation.

Burial 6 was the cremation of an adult whose estimated age was twenty-five to fifty years. The bones were placed in a storage vessel which was set at the southwest corner of a submerged boulder and covered with a flat stone. Twenty small, flat, disc beads and one made from a section of an olivella shell were found in the cremation. All had been burned with the body.

Burials 4, 5, and 6 were placed at or near fire site H, in the ashes of which were found fragments of burnt human bone. This no doubt is the site at which the three bodies were burned. Within the ashes of the fire were found fragments of a small pottery paint bowl, about two-thirds of which were reconstructed. It had evidently been burned with one of the bodies. Lack of care in the gathering of the bones from the ashes is indicated by the quantity of bones remaining in the ashes and scattered between the fire sites and the burials.

Artifacts were found in the soil from the surface to the base formation, but in the burial area and in the flat section the majority were in the lower six inches of the deposit.

No evidence was discovered which would indicate whether the house

site was constructed in a pit or on the surface. The fire deposit within the house and the stones marking the outline were directly on the base formation, as were also the metate and mano found. This indicates that the floor of the house was the base formation, which might suggest the conclusion that a pit had been excavated for the house. Also, not one of the large boulders within the burial area, now covered by soil, showed signs of having been used for grinding. This condition indicates that the boulders were covered when the site was inhabited. On the other hand, the soil surrounding the house did not appear to have been excavated and thrown from the house. Burnt rocks and artifacts were found at the same level throughout the house site and the adjoining area. Fire sites lay at various levels and, in one case, overlapped. These facts indicate that the deposit was gradually built up from the base.

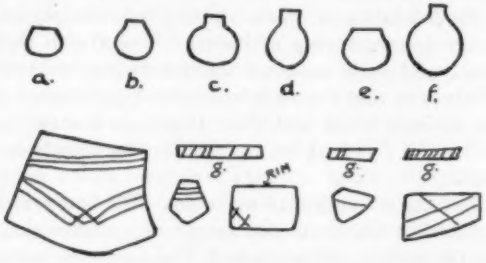


FIG. 19.—San Vicente Lake Bed. Shapes of vessels (*a–f*) and incised designs. *g*, edges of rim sherds.

The cremation fire for burial 1, which I believe to be the oldest, was on the base formation. The cremation fire for burial 2 was 6 inches above the base formation, indicating that this burial was the most recent. The fires for burials 4, 5, and 6 were also on the base formation.

Pottery sherds represented vessels of various shapes and sizes, including very small paint bowls, small food bowls, cooking vessels, and water- and food-storage ollas. The most common type was the cooking vessel. Food- and water-storage ollas were small to medium in size; no sherds similar to the large storage ollas commonly found in caves close to camps were noted.

Vessels used for burial purposes are described in Table 1. No particular type of vessel was used for the burials; any vessel available was used, regardless of its type.

Pottery is reddish brown with black smudged spots caused by the blaze or fuel touching the vessel during the firing period. A very com-

plete description of the methods of constructing and burning pottery in this region has been given by Malcolm J. Rogers, Curator of the San Diego Museum.[1] Food bowls and cooking vessels found at this site were constructed generally with straight rims, although there are a few slightly recurved rims. The storage ollas were made with recurved rims. The paste is dark gray to black and contains coarse quartz grains and mica as tempering material. A few sherds of light buff pottery with a bright pink paste were found. These are similar to the pottery described by Rogers as Kamia pottery,[2] known locally as "Desert Pottery."

Decorations are few and confined to incised lines on rim and shoulder (Fig. 19). Hardness, measured by the Moh Scale, varies from 2.5 to 4. The greater number of sherds are 3.0 to 3.5.

TABLE 1

DATA ON POTTERY VESSELS, SITE C

	Shelter	*Burial 2*	*Burial 3*	*Burial 4*	*Burial 5*	*Burial 6*
Shape	*a*	*b*	*c*	*d*	*e*	*f*
Height (inches)	3⅜	10	10½	11½	5½	12¾
Diameter (inches)	5	9¾	9¾	10½	6½	11⅜
Capacity (gallons)	¼	1¾	1⅜	2	⅜	3½
Thickness (inches)						
Neck	5/16	5/16	5/16	5/16	⅛	⅛
Wall	3/16	3/16	5/16	5/16	⅛	⅛
Bottom	5/16	⅜	5/16	⅜	¼	5/16
Depth of bottom below surface (inches)	Surface	22	25	30	30	25

Burial 2 was covered with an excellently constructed metate, worked into shape from a flat granite stone 3 inches thick. One end measures 12 inches wide, the other 9 inches, and the length is 23 inches. A depression an inch deep was picked into the face and partially smoothed. One-fourth of a flat stone metate was used to cover burial 1. The depression is 2½ inches deep. Half of a trough-type metate having a depression 4½ inches deep was excavated. Mr. Rogers informs me that this type belongs to the first and second periods, giving a date prior to 1450. The section of metate found in the house site was constructed with a depression an inch deep.

Manos were made of hand-size water-worn rocks secured from nearby gravel deposits. The majority of the rocks were used as found, the only modification being smoothing of the surfaces by grinding. Some are rectangular with rounded corners, others are disc-shaped. A very few show that skill and considerable care were exercised in shaping them.

Scrapers are scarce and vary from large rough-flaked to small fine-

[1] Malcolm J. Rogers in San Diego Museum Paper No. 3.

[2] *Ibid.*

flaked pieces. The one fist axe found has one end chipped to a bit, the other natural.

Projectile points are predominantly triangular in shape with the base varying from straight to a deep V indentation. Eight notched and two serrated points were found (see Table 2). Material used for the projectile points included quartz, a light green rhyolite, brown and black dacite, obsidian, chalcedony, and jasper. The number of points of each type of

TABLE 2

PROJECTILE POINTS CLASSIFIED AS TO MATERIAL USED

Materials	*Shelter*	*Burial Area*	*Flat*	*Rock*	*Slope*	*Burial 2*
Quartz	3	19	9	0	1	3
Rhyolite	0	6	3	2	0	1
Dacite	0	9	1	0	0	0
Obsidian	0	2	3	0	0	0
Chalcedony	0	1	0	0	0	0
Jasper	0	0	1	0	0	0

TABLE 3

CLASSIFICATION OF FLAKES

Materials	*Shelter*	*Burial Area*	*Flat*	*Rock*	*Slope*	*Total*
Quartz	27	270	125	109	10	541
Rhyolite	15	85	80	138	0	318
Dacite	7	157	98	176	6	444
Obsidian	0	13	3	17	0	33
Chalcedony	0	2	0	10	0	12
Jasper	0	0	0	0	0	0
Totals	49	527	306	450	16	1348

material is shown in Table 2. Chips or flakes collected in the camp are classified in Table 3. Most of the flakes consist of quartz, rhyolite, and dacite, indicating that the materials are local. Quartz and dacite are readily found near the site, but careful search has failed to locate the rhyolite deposit.[3] The obsidian, chalcedony, and jasper were no doubt transported from the desert area to the east. Points made of these materials were brought in already completed.

Two fragments of a pottery pipe, one the stem, the other a section of the bowl, were found. They are not sufficient to reconstruct the pipe, nor can the exact size and shape be determined. However, the pipe common in this area is tubular, bent in an arc, and constructed with a flat flange projecting from the center on the outside of the curve. A hole is made in the flange and there is a semicircular notch at the bottom.

There are two pottery sherds which have been cut to an oval shape

[3] Rhyolite was later found in gravel deposits near the camp.

and have had their edges smoothed. These were probably made for smoothing pottery. A flat piece of stone one-fourth inch in thickness has been shaped like the sherds.

Two sections of deer antler, cut at the tips, were evidently intended for use as chippers. A broken bone awl was in burial 2 and the points of two others were recovered in the excavation.

Nearby rats' nests were torn apart and a careful watch was kept during the excavation for evidence of basket work. The people of this region are known to have been expert basket weavers. Although old rats' nests seldom fail to disclose fragments of basketry, we found none at this site.

A number of shells common on the Pacific coast in the San Diego area were found in the deposit. These included abalone, clam, *pecten*, barnacle, coquina, limpet and olivella. With one exception, only the olivella shell was used for ornaments. The exception was a small section of abalone which had a hole drilled about halfway through. The olivella shells were made into beads by grinding off the tip of the spire. One complete bead and several fragments of these beads were found in burial 2. A section of another was in burial 6. Twenty small, white, disc shell beads, which had been burned with the body, were found with burial 6. This type of bead, which is common in camps throughout this area, is considered to be a type which was used for trade; it is probable that it came from the Channel Islands. The beads measure one-fourth inch or less in diameter. Other finds include a flat white shell bead $\frac{1}{16}$

TABLE 4

STUDY OF POTTERY SHERDS, SITE C

Location	*Number of Sherds*	*Thickness (mm.)*			*Thickness (in thirty-secondths of an inch)*		
		Min.	*Max.*	*Ave.*	*Min.*	*Max.*	*Ave.*
Shelter	62	3.2	6.3	4.1	4	8	5.2
Burial area	1837	1.7	9.5	4.6	2	12	5.8
Flat	970	2.4	7.9	4.4	3	10	5.6
Rock	458	2.4	6.3	4.1	3	8	5.2
Slope	28	3.2	7.9	4.7	4	10	5.9
West of creek	30	3.2	6.7	4.5	4	8	5.6

TABLE 5

SHELL BEADS

	Burial Area	*Flat*	*Slope*	*Burial 1*	*Burial 2*	*Burial 6*
Flat beads	1	0	0	1	0	20
Olivella shell beads	16	8	1	0	1	1

inch in diameter, a section of a small animal's skull drilled as a bead, and a half section of a large shell bead measuring 1½ inches across. The band of shell forming the last of these was 1 5/16 inches wide.

I was assisted by my wife throughout the entire survey. Miss Evelyne Curry assisted with the screening and collecting of artifacts. I also wish to extend my thanks to Mr. Malcolm J. Rogers, Curator of the San Diego Museum, and to his assistant Mr. Malcolm Farmer. Each of these gentlemen gave me valuable advice and help in the excavation and in classification of the artifacts. It is to be regretted that war conditions prevented Mr. Rogers from organizing a project for this survey.

About seventy-five cubic yards of earth were excavated. About half was broadcasted and the other half was screened through a quarter-inch screen. Such deposits as the ashes and the burials were screened through the quarter-inch screen, then through a one-eighth-inch screen, and finally through common house screen.

A careful watch was maintained at all times for evidence of contact with the early Spaniards, but none was found. The trough-type mortar indicates that the occupation of the site began prior to 1450, while the lack of contact material indicates that the occupation ended before 1650, the date at which Spanish influence began.

Groves of live oaks grow along the nearby ravines, furnishing acorns for food; the bones of deer and small animals indicate that meat was eaten with the acorns. The presence of sea shells makes it evident that the diet was supplemented by sea food.

Excellent caves among the large granite boulders on the slopes of the mountains were not used as shelters, suggesting that occupation of the site was seasonal, probably in the fall, before the rains began. The presence of obsidian, chalcedony, and jasper proves that the occupants wandered as far as the desert.

All artifacts found are like those found in camps of the northern Diegueño culture which occupied this area, extending eastward to the Imperial valley and southward into Lower California, Mexico.

I have tried to secure all data possible from this site before it is destroyed by the waters of the lake. I have set forth the facts as I have found them and hope they will help in future studies of the people who lived here.

3779 Kettner Boulevard
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June, 1943

ABSOLUTE CHRONOLOGY IN THE ANDEAN AREA

JOHN HOWLAND ROWE

ALTHOUGH a reliable relative chronology, based chiefly on the sequence of pottery types, is rapidly being built up for the Andean area, no method has so far been devised for turning the relative dates into absolute ones. As far as we know at present, no permanent method of dating, comparable to the Maya Long Count or even to the Mexican fifty-two-year cycle, was in use in any part of South America, and no one has yet investigated the possibility of building up a tree-ring sequence, even in the drier regions of Peru. Furthermore, the distances that separate the Andean area from the Maya area have so far prevented any correlation of the early pottery types of the two areas, so that we cannot even estimate the age of Peruvian remains in terms of the insecurely correlated Maya calendar. Of necessity, therefore, all absolute dates for the region now in use by archaeologists are based, for the Inca period, on Spanish recordings of Indian traditions and, for earlier periods, on reasoned guesses from the time of the Inca conquest of the region being studied.

This sort of dating demands a very intimate acquaintance with Inca historical material. So far, no one except Means has been sufficiently interested in this aspect of Andean cultural history to master it. Anthropologists cannot safely leave this sort of study to professional historians, few of whom have either any interest in the pre-conquest period or the theoretical background to interpret descriptions of Indian life and customs. Means' monumental summary, *Ancient Civilizations of the Andes*,[1] has become an indispensable handbook for field workers in the region, simply because he is that rare bird, a historian with anthropological training.

It is not surprising that most current estimates of absolute dates for archaeological periods in the Andes are based on Means' work.[2] The latest published table I have seen is on pages 488–489 of *The Maya and Their Neighbors*, the Peruvian part of which is apparently the work of Wendell C. Bennett, with certain ideas of S. K. Lothrop and A. L. Kroeber included.[3] This table will illustrate my point; the early cultures are dated by calculation from three "fixed" points: the Inca conquest of the Lake Titicaca basin, 1200 A.D.; of the South Coast, 1300 A.D.; and

[1] Means, 1931.

[2] An honorable exception must be made for J. Eric Thompson, whose *Archaeology of South America* represents his own interpretation of Inca historical problems. He follows Sarmiento.

[3] *The Maya and their Neighbors*, 1940, pp. 488–489.

of the North Coast, 1400 A.D. A glance at pages 228–229 of *Ancient Civilizations of the Andes* will indicate the source of the date for the conquest of the Titicaca basin; page 238 summarizes graphically the other two dates in a series of dated maps illustrating Inca conquests.

Unfortunately, the version of Inca history which Means presents in *Ancient Civilizations* is very far from being accurate, even within the limits of probable accuracy imposed upon us by the Incas' methods of recording history and the failures of the various Spanish scholars who have transmitted the Indian record. It is the purpose of this paper to show that the Inca conquests took place up to 250 years later than Means suggests and that, therefore, all archaeological dates must be moved up a corresponding number of years, altering not only the absolute relations of the archaeological periods but in some cases their relative positions also.

Means' chronology has two serious faults: (*a*) in determining which Inca conquered any given part of the Andean area he follows Garcilaso de la Vega, a seventeenth century chronicler who contradicts all earlier writers on this point; (*b*) his estimates of the duration of each Inca's reign are merely averages of all previous modern guesses and ignore better sixteenth century material. The bases for his chronology are not given in *Ancient Civilizations*, but may be found in three earlier papers, which are not nearly so well known as his great summary.[4] Our two objections are best considered separately.

The title of Inca was not restricted to the sovereign in ancient times, but was borne by any legitimate male descendant of previous rulers. The Incas made up a large class of men traceably related in blood who formed the ruling class of their empire and hence for political and social reasons had every interest in keeping accurate genealogical records of the ruling house. The core of these records, the list of actual rulers, must necessarily form the basis of any chronological study. Sarmiento de Gamboa probably had a better opportunity to check the genealogical aspect of his work than any other chronicler, since he consulted a greater number of descendants of the Incas than anyone else, and the accuracy of his list is corroborated by the majority of independent sources. He gives the list as follows:[5]

[4] Means, 1917, 1921, 1928.

[5] Sarmiento, corroborated by Las Casas, Cabello Balboa, Diego Fernandez, Cieza (1880), Cobo, Ramos Gavilán, Fray Antonio, Morúa, and Polo (1916*a*) (with the variation that Capac Yupanqui is put in third place. Acosta follows Polo). Means came to the same conclusion on this point, in spite of Garcilaso's disagreement. I have substituted *hu* for *gu*, *nqui* for *ngui*, *nc* for *ng* in Mango and Inga, and *s* for *c* in Cinchi to give these names a more familiar appearance. The familiar spellings are those of Garcilaso; Sarmiento uses a different but equally good convention. Of course, neither one represents the pronunciation of the names in Quechua.

1. Manco Capac
2. Sinchi Roca
3. Lloqui Yupanqui
4. Mayta Capac
5. Capac Yupanqui
6. Inca Roca
7. Yahuar Huaca
8. Viracocha
9. Pachacuti Inca Yupanqui
10. Topa Inca Yupanqui
11. Huayna Capac
12. Huascar and Atahualpa (d. 1532)

There is very little doubt as to the accuracy of this list. Garcilaso, Betanzos, and Acosta insert another ruler between Pachacuti and Topa Inca, but each gives the name differently. Garcilaso is hard put to it to explain in Book IX, chapter 40 why the Inca family left out his extra Inca in the official genealogy they sent to the King; the part of Betanzos dealing with the extra ruler is lost, the name being preserved only on a preliminary list, so that we do not know what Betanzos said about him; and Acosta simply made a mistake, as he took his account of Inca history from Polo de Ondegardo, who gives this part of the list in the "standard" form. Cabello Balboa evidently knew of a version in which an additional ruler was introduced in this place, and goes out of his way to deny it.[6]

In addition to keeping genealogies, the Incas made an attempt to preserve their history by reducing it to narrative verse. They had no form of writing and their *quipus* or knotted strings served only for recording numbers and as mnemonic devices,[7] so putting their history into verse was probably the best method they had of preserving it. They also made paintings to illustrate the account, but all these are unfortunately lost.[8] To illustrate the drawbacks of the "saga method" of recording history as practiced by the Incas, we cannot do better than quote Cieza's lively account:

> On these occasions, those who knew the ballads sang aloud, facing the Inca, the things that his ancestors had done. If there were, among their kings, one who had been remiss, cowardly, given to vices, and who preferred to enjoy himself rather than encrease the power of his empire, it was ordered that little or nothing should be said about him, and they took such good care to do so, that if anything was said it was so as not to forget his name and succession; but for the rest they were silent. This does not apply to the narrative poems of others who were good and valiant.
>
> And it should be noted that in addition it was their custom, and a well kept law, that each king should pick out, during his reign, three or four old men of his own nation, and, seeing that they were sufficiently able, bid them remember all the things that happened in the provinces during his reign, be they fortunate or adverse, and to compose narrative poems about them, so that it would be possible to know in the future that things had been so. However, these narrative poems might not be recited nor made public except in the Lord's presence, and those to whom this duty was entrusted might not speak of anything

[6] Cabello, N.D., III, 18, pp. 534–535.

[7] Locke, 1923.

[8] Sarmiento, 1942, cap. 9; Cobo, 1890–1893, XII, 2, p. 117.

that related to the king during his lifetime. When he died, they said to his successor in the empire, almost in these very words: "Oh great and powerful Inca, may the sun, the moon, the earth, hills, trees, stones, and your fathers keep you from misfortune and make you prosperous, happy, and fortunate above all men born. Know, that the things which happened to your forefathers are these." And saying this, with eyes on the ground and hands lowered, they gave him a complete account of all they knew, with great humility.[9]

Obviously enough, the result of this custom would be an "official" version of Inca history, different in emphasis if not in content from what actually took place, and subject to further errors in the process of transmission. We can probably assume, however, that the official account fairly preserved the order in which Inca conquests were made, and, in a few cases, we can check it with local traditions in different parts of the Empire. It would be, rather, Cuzco politics and the personalities of Inca leaders that would be subject to official censorship.

Clearly, it would be too much to suppose that we could reconstruct Inca history exactly as it happened from the material preserved by different Spanish chroniclers, but, if there is any measure of agreement among Spanish students who worked independently and with different groups of Indians, the agreement is best explained as the result of common knowledge of the official Inca version of their history, and we are one step nearer the facts.

In his *Biblioteca Andina* Means made a celebrated division of the Spanish chroniclers into two "schools," the Toledan and the Garcilasan, primarily on the basis of their critical or sympathetic attitude toward the Incas. He claimed, however, that the division also reflected a duality in the traditions of Inca conquest: that the Garcilasan School described the formation of the Inca Empire as a gradual process, while the Toledans put all the Inca conquests in the last four reigns. In practice, Means seems to have put a chronicler in one school or the other entirely on the basis of personal impressions of the man's attitude toward the Incas, for, in his "Summary of Impressions" on pages 518–521 of the *Biblioteca Andina*, he puts Las Casas in the Toledan School but Román y Zamora, who copied Las Casas slavishly, in the Garcilasan School.[10] Similarly, Sarmiento is classed as a Toledan, but Cabello, who made extensive use of Sarmiento and differs from him only in details and in the greater fullness of the parts describing Inca conquests in the north, is classed as a Garcilasan.

For chronological purposes, the important point is the dates of Inca conquests, and we will do better to classify the chroniclers strictly in

[9] Cieza, 1880, cap. 11, pp. 37–38, and cap. 12, pp. 39–40. Two fragments of post-conquest historical poems are preserved in Morúa, 1922, II, 15, Vol. 1, pp. 100–103.

[10] In this case, he is inconsistent, for on p. 451 Román is called a Toledan.

relation to that point, leaving Means' schools out of consideration for the moment. We can phrase our test question thus: "Had the Incas conquered territory more than about fifty miles from Cuzco at the beginning of Pachacuti's reign?" and classify the chroniclers by listing them under "Yes" and "No," according to their testimony. The dates are dates of publication or composition.[11]

No	*Yes*
Betanzos, 1551	Morúa, 1590–1605
Cieza, 1553	Fray Antonio, 1608
Polo de Ondegardo, 1561, 1571	Garcilaso, 1609
Las Casas, before 1561	Guaman Poma, 1613
Fernández, 1571	Vázquez de Espinosa, 1629
Sarmiento, 1572	Oliva, 1631
Román y Zamora, 1575	Calancha, 1638
Molina, 1579	Montesinos, before 1644
Cabello Balboa, 1586	
Acosta, 1590	
Pachacuti, early 17th century	
Ramos Gavilán, 1621	
Cobo, 1653	

Let us examine the "No" list first. It includes four especially distinguished chroniclers: Cieza, Sarmiento, Cabello, and Cobo, three of which—Cieza, Sarmiento, and Cobo—are completely independent sources. In addition, Betanzos, Las Casas, Fernández, and Pachacuti are independent of each other and of the first four. Román used Las Casas, Cabello used Sarmiento, Acosta and Cobo used Polo, and Cobo used also Molina. Ramos Gavilán I know only through Means' summary,[12] and I know nothing about his sources.

Not only does this list of chroniclers agree on our rather general test question, but they agree remarkably closely on all details that affect chronology. Furthermore, they include all the writers who finished their works in the sixteenth century, and hence were closer to the Incas than were later men. As we shall see, the "Yes" list does not give nearly so consistent a story.

We can summarize the chronology of the "No" list as follows:

1. *State of the Empire at the accession of Pachacuti.* Viracocha was the first Inca to try to organize conquered districts, instead of letting them alone to recover after each raid or merely trying to exact tribute. He

[11] See bibliography for full citations, and Means, 1928, for information about the chroniclers.

[12] Means, 1928, pp. 436–437.

established Inca rule over the valley of Cuzco, the neighboring valley of Anta (Jaquijahuana), the Urubamba valley down to about Calca and up to Quiquijana, and a district in the hills southwest of Cuzco called Cuyo.[13] All the chroniclers speak of small conquests by previous rulers, but it is clear from the fact that the places had to be reconquered later that these efforts were merely raids, as Sarmiento says. Cieza and Cobo say that Viracocha also conquered the Canchis, in the Urubamba valley above Quiquijana, but Polo explains that the Canchis were left with sufficient independence to serve Pachacuti as mercenaries, so we should probably take this conquest as a victory not followed by immediate incorporation into the Inca dominions. Cobo follows Garcilaso for the only time in his history of the Incas when he puts the defeat of the Chancas at the beginning of Viracocha's reign instead of at the end. As this story does not appear before Garcilaso's history was published, it must be regarded as Garcilaso's invention.

2. *Conquests of Pachacuti*. Pachacuti won his crown by turning back a formidable invasion of the Chancas, natives of Andahuaylas, before which Viracocha and the preferred heir, Inca Urcon, had found themselves helpless. His first conquests were down the Urubamba valley, where he took the region between Ollantay and Vilcabamba in which Machu Picchu stands.[14] Then he turned northwest and occupied the Chanca country, the Soras, Lucanas, Cotabambas, and other neighboring nations, getting as far as Vilcas, near Cangallo. To the south, he occupied the state of Chucuito, which had had a friendly alliance with his father, and incorporated the Canchis firmly into the Empire. Except for one later campaign, in which he occupied the rest of the northern part of the Titicaca basin, Pachacuti did no further conquering in person.[15] At this time, one of his generals named Capac Yupanqui raided the Chincha valley and other parts of the South Coast but withdrew without conquering the region.[16] Next, Pachacuti dispatched another expedition to the north, with orders not to go beyond the Yanamayo (probably the tributary of the Marañón which flows through Pomabamba). A Chanca contingent went along but was attacked by the rest

[13] Sarmiento, 1942, cap. 24–25; Cabello, N.D., III, 14; Cieza, 1880, cap. 38–42; Cobo, 1890–1893, XII, 11; Polo, 1916*b*, pp. 50–51; 1940, p. 132; Las Casas, 1939, cap. 16 (*Historia Apologética*, cap. 250).

[14] Cobo, 1890–1893, XII, 12; Cabello, N.D., III, 14.

[15] Cieza, 1880, cap. 47–48; Sarmiento, 1942, cap. 34–37; Cobo, 1890–1893, XII, 12–13; Cabello, N.D., III, 14–15; Fernández, 1571, f. 126; Ramos Gavilán, 1621, I, 3. Cobo adds that Pachacuti raided around the south shore of Lake Titicaca on this campaign.

[16] Cieza, 1880, cap. 59; Castro, 1934, pp. 134–135. Cobo, 1890–1893, XII, 13, says that the coast was conquered.

of the army and fled north and east into the Huallaga valley. The rest of the army gave chase, and, spurred on by their desire to catch the Chancas and their continuous successes against the small mountain tribes, they got as far as Cajamarca, well beyond the Yanamayo. Cajamarca put up a stout defense with the aid of its Chimu allies from the coast, but the Inca army won a decisive victory. When the army returned home from this long and successful raid, the general in command lost his head for disobedience of orders. Part of the territory traversed was systematically occupied: Cieza suggests up to Lake Junín (Bombon).[17]

At this point, Topa Inca, Pachacuti's heir, took command of the army. Cieza says he succeeded to the throne, but Sarmiento and Cabello say that he was commander-in-chief for some years before Pachacuti abdicated. It seems to me very likely that Cieza's informants confused Topa Inca's position as commander-in-chief with full political power, and I am inclined to feel that Sarmiento and Cabello have better preserved the original official version. The only serious difference in chronology that results from this confusion is a difference in the date assigned to the campaign in the montaña and the revolt of the northern Titicaca basin, which are closely associated in all accounts with Topa Inca's succession.

Topa Inca proceeded to add the whole of the northern highlands as far as Quito to the Empire in campaigns described in most detail by Cabello. From Quito, Topa Inca went to Manta, at which point Sarmiento and Cabello recount the famous tale of the voyage to the islands of Ava Chumbi and Niña Chumbi, somewhere in the Pacific. Topa Inca then went on to conquer the North Coast, from Tumbez through the Chimu dominions. It was after this campaign that Topa Inca succeeded his father.[18]

His first campaign as Inca was against the Antis of the montaña along the upper Madre de Dios River, but he was recalled from this to put down a serious rebellion of the Collas and Chucuito, in the Titicaca basin. He followed up this victory by a long campaign in Charcas (Bolivia) and Chile, in which he added most of highland Bolivia, Atacama, Coquimbo, and Chile as far as the Maule River to his domains. Tucumán also submitted, according to Cobo, but the Inca did not visit it in person. On his return, he fought his way up the South Coast to Pacha-

[17] Sarmiento, 1942, cap. 38; Cabello, N.D., III, 15 (Cabello divides this campaign in two); Cobo, 1890–1893, XII, 13 (no details of the campaigns given); Cieza, 1880, cap. 49–50, 56 (does not mention the raid to Cajamarca).

[18] Cabello, N.D., III, 15–18; Sarmiento, 1942, cap. 44–46; Cobo, 1890–1893, XII, 13; Cieza, 1880, cap. 56–58.

camac, meeting with his most serious opposition in Chincha.[19] None of our faithful chroniclers mentions the region of Arequipa; it was apparently conquered either by Pachacuti or Topa Inca, and our only evidence, outside of Garcilaso, is from Morúa, whose chronology is hopelessly confused. He speaks of an earthquake in Pachacuti's time which destroyed the Inca towns there, implying that the region had already been conquered.[20]

3. *Conquests of Huayna Capac.* Huayna Capac had quite a task of consolidation to do to make his father's quickly won conquests integral parts of the Empire, and he was faced with a number of serious revolts. He did manage, however, to extend Inca rule in Chachapoyas, where his father had raided, and to the Ancas Mayo River on the northern border of Ecuador, as well as to conquer the difficult Ecuadorean coast country. The Inca dominions in northwestern Argentina were probably also extended in Huayna Capac's reign, although we have no specific information about Inca activities in this area. During this time, Charcas was invaded by the Chiriguanos, a warrior tribe of Tupi-Guarani speech, who later gave the Spaniards considerable trouble.[21]

Considering the number of possible sources of error involved in the Inca methods of transmitting history and the capabilities and opportunities of the different chroniclers, the discrepancies between the accounts we have summarized are remarkably small, and, in my opinion, the agreement is sufficient to justify the view that all the chroniclers of the "No" list derived their information from a common Indian tradition which represented the "official" Inca version of Inca history. I will refer to our reconstruction of this "official" history as reflected in the chroniclers cited above as the "standard version," to distinguish it from the lost original.

This standard version is supported by a considerable amount of incidental evidence from other sources. Very important indeed is a paragraph in the *Relation* of Pedro Sancho, written in 1534, in which he refers to a lord who built Cuzco and the fortress of Sacsahuamán and conquered as far as Vilcas. The description fits Pachacuti of the standard version exactly, but will not fit any of Garcilaso's Incas. This remark of Sancho's is the earliest mention of Inca history we have which goes back of Huayna Capac.[22] Also worthy of note are the sworn statements

[19] Cieza, 1880, cap. 59–60; Cabello, N.D., III, 18–20; Sarmiento, 1942, cap. 49–50; Cobo, 1890–1893, XII, 14.

[20] Morúa, 1922, IV, 11, Vol. 2, pp. 40–41.

[21] Cabello, N.D., III, 20–24; Cieza, 1880, cap. 63–66; Sarmiento, 1942, cap. 58–60; Cobo, 1890–1893, XII, 17.

[22] Sancho, 1917, cap. 17, p. 194. Compare Fernández, 1571, II, iii, 5, f. 126.

taken down from a long series of old Indians by order of Viceroy Toledo in 1570–1572. This testimony varies considerably in value, depending in part on the methods used in gathering it and in part on the intelligence of the witnesses and the amount of history they knew. In the earlier interviews, the Indians were asked leading questions and allowed to

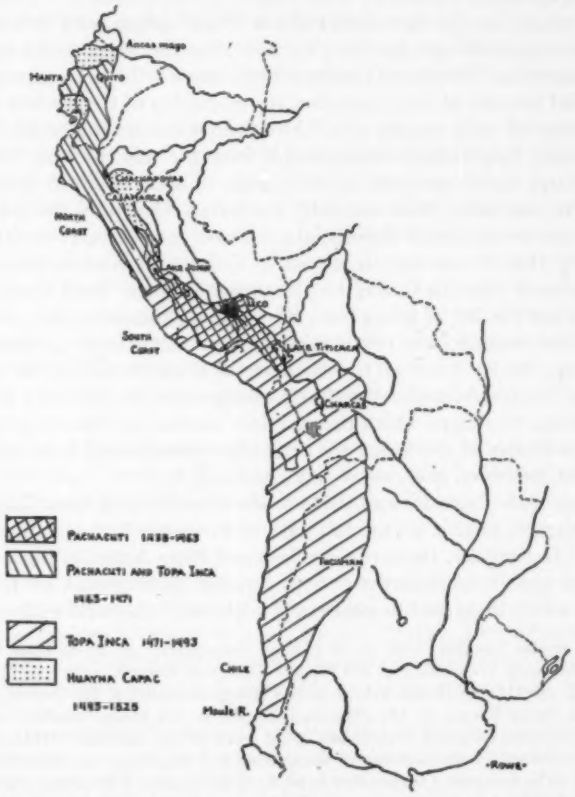

FIG. 20.—Territorial expansion of the Inca Empire from 1438 to 1525, according to the standard version.

talk; later, questions phrased somewhat vaguely on the basis of previously collected information were put to large groups of Indians, to be answered briefly, often by "yes" or "no." Even in the later testimonies, however, valuable incidental information is given in the identifications

of witnesses inserted at the beginning of each interview. Since many of the witnesses were descendants of men moved by the Incas from one part of the Empire to another, much information on Inca conquests, valuable because it was not the prime object of the questioning, can be gathered from these identifications. This information consistently bears out the standard version.[23]

In comparing the chroniclers of our "Yes" group with this standard version and with one another, we find that the group is by no means homogeneous. Morúa and Guaman Poma are worthless for chronological material because of their incessant contradiction of themselves and lack of agreement with anyone else.[24] Montesinos is a special problem, as his account of Inca history is inseparable from the tale of a long list of pre-Inca kings which precedes it and which, in spite of much heated controversy, has never been carefully evaluated. Certainly the long list of kings was never part of the official version of Inca history, and it is most unlikely that it was ever invented in Cuzco. Montesinos himself may have passed through Cuzco, but he probably never lived there, and he did *not* get the list of kings from Blas Valera, the only other chronicler who preserves it, for the two men's lists are very far from agreement.[25] In any case, the list bears all the earmarks of a late invention, of the same sort as Plato's Atlantis: the deeds ascribed to the pre-Inca kings are projections of actions which the standard version ascribes to later Incas, and the names of the kings are similarly reflections of Inca titles. The king list, however, deserves a paper to itself.[26]

Vázquez de Espinosa and Oliva follow Garcilaso, as does Calancha in lesser degree, so that we are left with two independent accounts of Inca history to consider, those of Garcilaso and Fray Antonio. Both of these authors give straightforward and detailed descriptions of Inca conquests which disagree fundamentally with each other and with everyone

[23] Compare Levillier, 1940, p. 19 (Alonso Pomaguala), pp. 55–58 (Joan Puyquin), p. 92 (Hernando Vilcurimac), p. 108 (Gaspar Caña and Alonso Condor), p. 113 (Gomez Condori), pp. 114–115 (Pedro Ychoc), p. 133 (Diego Carquin), p. 143 (Santiago Chuqui Cati and Pedro Vacas), p. 151 (Martín Huaypo), p. 159 (Diego Gualso), and many others. It should be noted that Means' utter scorn of this testimony (1928, p. 497) is partly motivated by the necessity of discrediting it if Garcilaso's account of Inca conquests is to be accepted. On the other hand, Levillier's praise of the sworn statements is unjustifiably fulsome. Like other sources, they are valuable within their limitations.

[24] Harry Tschopik, Jr. informs me, however, that Book III of Morúa is a first-class source for Aymara historical ethnology, as Morúa was once the Cura of Capachica on Lake Titicaca and studied the Aymara personally.

[25] This was pointed out long ago by Riva Agüero, 1910, p. 75, n. 1.

[26] Imbelloni, in his 1941 paper on Montesinos, leaves the question of the origin and value of the king list just where he found it. The paper's only serious contribution lies in its brilliant untangling of Montesinos' chronology.

else. Fray Antonio[27] claimed to have based part of his work on statements made by the quipu-keepers to Governor Vaca de Castro (1541–1544), but he himself wrote in 1608. He gives the following chronology:

1. Manco Capac Inga—conquered ten leagues around Cuzco.
2. Chincheroca—conquered Canas and Canchis and the Chancas.
3. Lloque Yupangue—did no conquering.
4. Mayta Capac Inga—did no conquering.
5. Capac Yupangue—conquered to Vilcas and the Soras, Aymaraes, Condesuyos, and Parinacocha. On the south, he pushed to Paucarcolla near the lake.
6. Inga Roca—did no conquering.
7. Yavar Uacac Inga—conquered from Condesuyos to the coast, and in the Titicaca basin to the Desaguadero and Huancané.
8. Viracocha Inga—conquered to Paria, including Pacajes, Carangas, Charcas, and the eastern shore of the lake (Omasuyu). In the north, he reached the highlands behind Trujillo, and Huanuco.
9. Inga Yupangue, Pachacuti—conquered the rest of Charcas, Chichas, and Diaguitas; the Antis, Chunchos, Mojos, and Carabaya in the montaña; and Tarapacá on the coast. He also conquered the rest of the northern Highlands as far as Quito.
10. Topa Inga Yupangue—extended the conquest of Quito and added Chile.
11. Guayna Capac Inga—conquered Guayaquil and Puna.[28]

The differences between this account and the standard version given above need no emphasizing, and a comparison with the text of Garcilaso or Means' maps, which are so largely based on it.[29] will show equally important differences.

Garcilaso published his *Royal Commentaries* in 1609; they embodied his own recollections dating from before 1560, when he left Peru at the age of twenty-one. Although he used Cieza's *Travels*, Diego Fernández, and Acosta, whom he quotes, and in his boyhood knew Polo personally at the very time Polo was making his inquiries about Inca history,

[27] Means identified him as Calancha, but p. 330 of the *Biblioteca Andina* to the contrary, Calancha's account of Inca history does not resemble Fray Antonio's in the least.

[28] Fray Antonio, 1920, pp. 7–23. Because Fray Antonio claimed that his *Relation* represented a report made in the early 1540's, most interpreters of Inca history have claimed that he supported their view. So Riva Agüero and Means, apologists for Garcilaso, say that the *Relation* supports Garcilaso (Riva Agüero, 1937, p. 616; Means, 1928, pp. 329–330), and Levillier, apologist for Sarmiento, claims that it supports Sarmiento! (Levillier, 1942, cap. 1). Levillier's reconstruction of Inca history and the series of maps based on it are completely unusable because he has tried to reconcile Fray Antonio with the standard version, following one or the other in an entirely arbitrary manner.

[29] Means, 1931, p. 238.

Garcilaso shows no trace of the standard version. When he quotes an earlier writer on Inca history it is only to contradict him.[30] Garcilaso claims to have heard his version of Inca history from his mother's Inca relatives whom he knew as a boy, but forty years is a long time to remember all the details which he gives.[31] Means has always regarded Garcilaso as one of the greatest of all the chroniclers and was quite ready to take his word against the rest, if necessary. I agree as to Garcilaso's greatness, and have myself used him as much as anyone, but the weight of evidence is so heavily against his history of the Incas that I feel we must reject it unconditionally. The most damaging observation that can be made about the chroniclers in our "Yes" group is, then, that no two of them agree on the sequence of Inca conquests, except when they are copying each other outright.

In the light of probability and mutual agreement on the relative chronology of Inca conquests, Means' classification of the chroniclers into a Garcilasan and a Toledan School is not of much use. If one remembers that the classification was originally made along wholly different lines, reflecting the attitudes of the chroniclers towards the Incas rather than their versions of Inca history, the classification can still be used with some profit. It is unfortunate that Means himself did not keep this distinction in mind when he wrote *Ancient Civilizations of the Andes*.[32]

In his 1921 paper, Means proposed a makeshift absolute chronology of Inca reigns, compiled by taking an average of the opinions of all other modern scholars on the matter. He was driven to this step by the lack of reliable dates in the chronicles, and he has never made any claims that the dates he proposed were accurate. That other writers have taken them a little too literally is not his fault. We will probably never be able to date the Incas exactly, for the reason that the Cuzco Indians took no interest in the passage of years. As Cobo says, "They did not count their age in years, nor the duration of their actions, and they had no fixed point of time from which to measure events, as we count from the birth

[30] For instance, Garcilaso, 1723, Part I, Book v, Chapter 18 (Acosta), and I, iii, 14 (Cieza).

[31] The question of how much Garcilaso owed to Blas Valera, whose work he frequently quotes, has no bearing on the value of Garcilaso's evidence for chronology, as he never quotes Valera to support his story of Inca conquests. Compare also Levillier, 1942, cap. 2.

[32] Levillier's criticism of Means' schools is just up to a point, but his principal objection is to the use of Toledo's name to label the "Toledan School," rather than to the classificatory usefulness of the two schools. After all, the labels are of small importance. Levillier, 1940, pp. lxxix–lxxx. These historical matters will be dealt with more fully in the writer's *The Writing of Inca History*, in preparation.

of Our Lord Jesus Christ; there never was an Indian, and there is hardly one today, who knows how old he is, and much less how much time has passed since any remarkable event that happened here." A glance at the sworn statements collected for Toledo will illustrate Father Cobo's point exactly, and for this reason the dates given by Sarmiento are wild and impossible, and those of Vázquez de Espinosa are nearly as bad.[33]

Only one other chronicler besides Sarmiento and Vázquez gives a list of dates for the Incas, and that is Cabello Balboa, who cannot be so easily dismissed. Although his dates for the early Incas give impossibly long reigns, we must remember that, according to our standard version of Inca history, this period was largely legendary and no permanent conquests had been made. Inca history gets onto a solid footing with the reign of Viracocha, and at precisely this point Cabello's dates become reasonable. They are:

Viracocha deposed	1438
Pachacuti ruled	1438–1471 (33 years)
Topa Inca took command	1463
Topa Inca ruled	1471–1493 (22 years)
Chile conquered	1473
Huayna Capac ruled	1493–1525 (32 years)
Huascar ruled	1525–1532 (7 years)

We have, of course, no way of knowing where Cabello got these dates, but he probably did not get them in Cuzco, where he is not known to have lived. This fact is rather a recommendation than a criticism, as it is possible that in some other part of the Andean area there were Indians who kept more accurate dates. In any event, Cabello studied the Incas in the sixteenth century, when more information was available than we have now; he was a good scholar, as a comparison of his work with other chroniclers readily shows; and the dates are not only reasonable, they are some of the most conservative figures ever suggested. By contrast, Means' suggestions add about ten years to each reign. It is interesting also that Cabello knew and rejected Sarmiento's dates.

I would suggest that Cabello's dates are the most plausible ones we have or, indeed, are ever likely to have. For the earlier Incas, it would be better not to guess at all, but we can calculate the approximate date of the founding of Cuzco by assuming that each Inca reigned about twenty-five years. The resulting date would be prior to 1250.[34] If we recall that each Inca was the son of the preceding ruler and assume three genera-

[33] Cobo, 1890–1893, XII, 24, p. 228; Means, 1928, pp. 476–478; Vásquez de Espinosa, 1942, sec. 1536–1579.

[34] Compare Thompson, 1936, p. 34.

tions to a century, we get a date earlier than 1150 but hardly as early as Means' date of 1105 for the accession of Sinchi Roca would imply.[35] The earliest possible date for the founding of Cuzco would be 1132, and the event may have taken place much later.

These dates and the reigns to which we assign Inca conquests have a very important bearing on archaeological interpretations in the Andean area which we can illustrate by applying them to the three areas summarized in Table 11 in *The Maya and their Neighbors:* the South Highlands, the South Coast, and the North Coast.

In the South Highlands, the better known earlier cultures of Tiahuanaco, Pucara, Chiripa, and Chanapata seem to have disappeared long before the Inca conquest, although it is possible that Decadent Tiahuanaco pottery continued to be made in some districts until a comparatively late date. The later material consists of a number of local pottery styles which seem to represent different aspects of a rather homogeneous material culture and which fall within the Inca occupation and the period immediately preceding it. The vitality of the local styles is impressive; an occasional piece with local designs on a Cuzco shape or an odd Inca piece in a local grave lot is about all the ceramic evidence for the Inca occupation. The same situation holds in architecture; Inca stone cutting was adopted by the local masons, but it was used on buildings of a purely local type, such as the Inca-uyu at Chucuito or the larger chulpas at Silustani.[36]

The later styles can be almost certainly identified as belonging to the various small states which the Incas found in the region, particularly those of the Lupacas (capital, Chucuito) and of the Collas (capital, Hatun Colla) on the west shore of Lake Titicaca which Cieza describes.[37] Other local styles at places like Taraco and around Azángaro are of the same date and probably represent other cultural centers not so well described in our documents. If we estimate the Inca conquest of Chucuito at 1445, from Cabello's dates, we should allow for a few years of previous Inca influence and probably a century or two for the flourishing of the local styles before we reach Decadent Tiahuanaco, which has not been found associated with the local pottery (Chucuito Polychrome) at Chucuito. Even so, Decadent Tiahuanaco must be dated some two hundred years later than Bennett suggests, or about 1200 A.D., and his perfectly reasonable estimates of the duration of the Tiahuanaco styles

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[35] Means, 1931, p. 223. Four hundred years is Garcilaso's guess for the duration of the Inca dynasty (Garcilaso, 1723, I, ii, 1).

[36] Tschopik, N.D.; Squier, 1877, pp. 354, 378; and personal observations of the author. [37] Cieza, 1880, cap. 4, 42, 43.

in the Bolivian area should be moved up to correspond to the terminal date for Decadent Tiahuanaco.

Cabello's dates imply that the earliest Inca influence was felt on the South Coast about 1440, at the time of Capac Yupanqui's raid, with the conquest coming about thirty-five years later, in approximately 1476. The implied short Inca occupation fits admirably the archaeological material collected by Max Uhle in Chincha, where the group of material classified as Late Chincha II showed small Inca influence but included a Spanish glass bead.[38] In the Ica valley, the evidence is even stronger, for there Late Ica I graves contained glass beads, while the transitional and Inca-influenced material is grouped in a Late Ica II.[39] It should be recalled that the divisions into I and II in this case have no chronological significance but are merely classificatory groups. Some of the Late Ica I material is obviously later than Late Ica II. The important point, however, is that Inca domination of these valleys was so short that the local styles maintained their independent existence until the Spanish conquest. The date of 1100 for Late Ica given in the 1940 table is, therefore, far too early, and a better estimate would be 1300 or after for the beginning of the style, making it contemporary with Late Chimu instead of earlier.

For the North Coast, Cabello furnishes us with additional data. He collected a series of genealogies and origin legends in the valley of Lambayeque which make that valley the best documented one on the coast. First, he describes a semi-legendary dynasty of rulers founded by a man named Naymlap, who came from "the upper part of this Peru." Means translates this phrase as "north," but with reservations.[40] Bennett suggests that the migration was from the *south*, the region of higher *culture*.[41] I believe that Bennett is right, but not for the reason he gives. A number of Spanish chroniclers use the verb "bajar" (to go down) in speaking of traveling north, either because of the orientation of the maps they were accustomed to, or for some other reason, and hence the "upper part" of Peru would be the south.[42]

The Naymlap dynasty included twelve rulers, with a span of perhaps 300 years, as Means suggests.[43] There followed an interregnum of un-

[38] Kroeber and Strong, 1924*a*, pp. 47–50.

[39] Kroeber and Strong, 1924*b*, pp. 116–119.

[40] Means, 1931, pp. 51, 54.

[41] Bennett, 1939, p. 120.

[42] "A Yavarvacac Inga subcedió Viracocha Inga. Este conquistó hasta Paria, todos los Pacajes y Carangas y se vinieron de paz parte de los Charcas y todo Humasuyo hasta Guarina; y por abajo conquistó todo lo que al presente es distrito de Guánuco y parte de lo de Truxillo por parte de la serranía por el camino de Quito." Fray Antonio, 1920, p. 15.

[43] Means, 1931, p. 55.

specified length, and then the valley was conquered by the Chimu ruler of the valley of Trujillo and a dynasty of Chimu governers was installed. Cabello says that in the days of Oxa, the third of these governers, the Incas were making their first raid to Cajamarca (about 1462). The date of the Inca conquest of Lambayeque is not specified, but it must have been about 1470, in Cabello's chronology, and perhaps took place during the term of Oxa's successor, Llempisan, whose rule seems to have been followed by a troubled period, for three of his sons ruled in succession. The beginning of Chimu rule in Lambayeque can scarcely be dated much before 1420 if the third governor was ruling in 1462.

Bennett's archaeological sequence for the Lambayeque valley, omitting hypothetical periods which he did not find, is: (1) Chongoyape (a Chavín manifestation); (2) Middle Lambayeque II (Late Middle period); and (3) Late Lambayeque, divided into two sub-periods, the first without Inca influence, the second with definite, but surprisingly slight, Inca influence.[44] Now, if this sequence can be correlated with Cabello's historical and legendary material at all, which is not certain because of the scantiness of the historical evidence, the Late Periods should correspond to the Chimu overlordship, the Middle Period, to the Naymlap dynasty, giving us a sequence something like this:

Chongoyape
Middle Lambayeque II ?1050–?1350
Late Lambayeque I *ca.* 1420–*ca.* 1470
Late Lambayeque II *ca.* 1470–1532

Corresponding, but somewhat earlier, dates can be postulated for Middle Period material and Late Chimu in the Moche-Chicama region. Neither Means' suggestion that the Naymlap dynasty was Early Chimu nor Bennett's alternative possibility of Late Chimu fits the evidence satisfactorily.[45]

In general, the balance of historical probability and of the available historical evidence favors the reduced chronology discussed in this paper. Means felt that Garcilaso gave a more "rationalistic" account of the rise of the Inca Empire than, for example, did Sarmiento; it seemed to him more likely that such an empire should have been built up slowly than that it should have developed in a short space of time under a few rulers.[46] Actually, however, Garcilaso's description of the gradual character of Inca conquests is extremely improbable and would provide grounds for suspecting his account even if there were not such a mass of

[44] Bennett, 1939, p. 123.

[45] Means, 1931, p. 55; Bennett, 1939, p. 120; Cabello, N.D., III, 17.

[46] Means, 1917; 1928, pp. 322–323; Riva Agüero, 1910, pp. 116–118; compare Levillier, 1942, pp. cxxvi-cxxxvii.

independent testimony against it. In a state ruled as autocratically as was the Inca Empire, a long process of gradual expansion implies a long line of unusually competent rulers, and the slightest examination of the history of other dynasties makes it very clear that a succession of more than two or three able rulers is a very rare occurrence. A series of twelve rulers of the caliber described by Garcilaso is fantastic.

It was perhaps more difficult in the days before the blitzkrieg to understand how a small but efficient army could overrun vast areas and apparently powerful states quickly, and with little opposition; now, unfortunately, it is very much easier to believe that Topa Inca could have overrun the whole mountain region between Quito and central Chile in thirty years of campaigning.

The available archaeological evidence is equally favorable to a shorter span for the Inca domination. Throughout the highlands of southern Peru, Inca rubbish heaps are notably shallow, and, outside of Cuzco, the nature of the materials is such as to suggest influence rather than intensive cultural occupation. The unity of Inca style at Cuzco, both in architecture and pottery, is also very striking. The differences in masonry, which were formerly considered to have chronological significance, depend instead on the kind of stone used and the purpose of the wall, and there is abundant evidence of associations to show that all Cuzco masonry types, including the great walls of Sacsahuamán, are approximately contemporary.[47] The ninety-four years which Cabello allows between the accession of Pachacuti and the Spanish conquest is ample for all known constructions in Inca style, considering the numbers of skilled workmen available for public works under the Incas. Jijón y Caamaño has pointed out further reasons for preferring the shorter chronology, including the notable survivals of pre-Inca languages and religious cults in regions comparatively near the capital.[48]

Many Americanists are inclined to deplore the recent tendency to reduce the antiquity attributed to familiar archaeological cultures in both American continents, perhaps without entirely realizing that the reduction is no fad, but results from the constant striving after greater precision of method and interpretation which is the common glory of all science. New chronological estimates are accepted only if they are, in truth, backed by better evidence than their predecessors, and the present revision is proposed in the belief that it eminently fulfills this es-

[47] Rowe, 1944, and further unpublished studies. It should be noted that the chroniclers of the standard version agree in stating that Pachacuti entirely rebuilt the city of Cuzco. See especially Betanzos, 1880, cap. 11; Sarmiento, 1942, cap. 30.

[48] Jijón y Caamaño, 1934; as an example, compare Ulloa Mogollón, 1885, on the Collaguas near Arequipa.

sential requirement. Furthermore, we should be very careful not to assume that, because Late Ica, for example, is two hundred years later than was formerly supposed, the beginnings of Andean culture are also later. All dates for the earliest periods are, and always have been, exceedingly unreliable guesswork, and much more exploration is necessary before it will be safe to suppose that we have found the beginnings of the high cultures in the Andean area.

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THE "ANCIENT STONE FISH TRAPS" OF THE COACHELLA VALLEY, SOUTHERN CALIFORNIA

ADAN E. TREGANZA[1]

A GROUP of small stone enclosures, supposed by some to be of natural origin and by others to be the works of man, lies on a rocky travertine-encrusted talus slope at the base of the Santa Rosa Mountains on the west side of the Coachella Valley in Riverside County, California. These phenomena are known locally as the "Ancient Fish Traps." They occupy a series of rocky terraces some 90 feet below the maximum high-water shore line[2] of Ancient Lake Cahuilla[3] (called by some Blake Sea), whose basin is now partly occupied by the Salton Sea. The "traps" consist of 85 to 100 bowl-like depressions composed of a travertine-encrusted granite talus debris. They are arranged in three rows, each of which follows the exact contour of one of the old recessional terraces of the lake (Pl. XIX).

A brief résumé of the very recent geology and physiographic features of the area will give a fuller understanding of the conditions concerned with the present problem. The Salton Sink, as it has come to be known, is a great sub-sea-level depression filled with alluvium, and roughly 80 miles long by 30 miles wide. It is bounded on the east by the Colorado River and the Chocolate Mountains and on the west by the Peninsular Ranges. To the north, the depression slopes upward, finally merging into the Mohave Desert. Southward it is separated from the Gulf of California[4] by a rise in elevation and a similar but smaller depression, the Pattie Basin, which contains the intermittent alkaline lake, Laguna Salada (Maguata).[5] In the past, during seasons of heavy rainfall along the upper regions of the Gila and Colorado rivers, the rapid rise of water along the lower course of the river would cause it to break through the natural levees and inundate the Salton Basin. This happened during the years 1905–1907, when the present Salton Sea was formed. It has been assumed that about 900 A.D.[6] the Colorado River flooded the basin,

[1] The author extends his appreciation to Mr. Dewey Moore of Riverside, California, for the aerial photograph, to Dr. R. F. Heizer of Berkeley for his Nevada notes and criticism, and to Mr. E. W. Schenck of Twenty Nine Palms for his correspondence and criticism.

[2] The shore line is 40 feet above present sea level. See Fig. 21.

[3] Williams, 1853; MacDougal and Sykes, 1915; MacDougal, 1907, 1914, 1917; Jones, 1914.

[4] Kniffen, 1932, p. 156.

[5] Treganza, 1942, p. 155. The cultural remains around this lake are the same as those found around Lake Cahuilla.

[6] Rogers, 1938, p. 121.

forming a lake which we now call Ancient Lake Cahuilla. This body of water existed until 1500, or for a period of about six hundred years. During this time the lake went through periods of high and low stages and corresponding periods of fresh and brackish water, depending on whether the Colorado River was flowing into the Sink or the Gulf of California. No doubt the lake abounded with wild fowl, fish, and freshwater mollusks. The shore must have been fringed with a dense growth of arrowweed, tule and willow, while further up the slopes, mesquite probably flourished with the abundance of water. In general, the whole pattern must have been ideal for primitive occupation.

The "traps" show two methods of construction. At the northern end of the terrace the stones were piled up to a considerable height and circular pits were formed by removing rocks; at the southern end, stones were piled up on the natural surface to form enclosures of a more or less rectangular form.[7]

The circular depressions, where not disturbed by vandalism, have fairly flat bottoms filled with small stones, whereas the rectangular ones rest on a natural base of sand and gravel. One feature is common to almost all of them: on the side facing the valley floor the side walls have been removed in two places, leaving a central pier.[8] These enclosures vary from 10½ feet in diameter by 6 feet deep to 4 feet in diameter by 2 feet deep. The linear distance covered by the entire group is about 450 yards. That these enclosures are post-lake is evident, as the rocks used in construction at the southern end do not show a consistent coating of travertine on like surfaces, and some are not encrusted at all. This admixture implies transportation from various elevations along the terraces.

This unusual aggregation of remains has for many years aroused the interest of both scientist[9] and layman. There are two explanations concerning the origin of the term "Ancient Fish Traps," the first of which is probably closer to the truth: (1) it is very probable that old Lake Cahuilla contained a number of species of fish,[10] and, since these odd

[7] See Pl. XIX for both forms.

[8] At first this was thought to be the work of vandals, but its occurrence is so consistent that it is considered to be an original feature. Gates, 1909, noted this same feature and was told by an Indian informant that the open sides next to the sea were for the purpose of holding a net when the tide was going out.

[9] Drucker, 1937, p. 47; Rogers, in Jaeger, 1938, pp. 120–122; Steward, 1929, pp. 84–87; Kniffen, 1932, p. 186; Strong, 1929, p. 87; W. E. Schenck, unpublished notes and correspondence; Gates, 1909; Amsden, 1928.

[10] When the Salton Sea was formed in 1905–1907, it contained Hump Backed Suckers, Mullet, Colorado River Trout and Carp. Jaeger, 1938, p. 75.

It may be assumed that Ancient Lake Cahuilla contained the same species, as the

unexplained pits were situated on the shore line of an ancient lake, it is easy to understand how early white settlers might interpret such enclosures as fish traps; (2) though it is not recorded by any ethnologist, the present-day Cahuilla Indians tell a story about how these pits were used as fish traps. Each depression, they say, was tended by one man. The men used to sit on a hillside back of their traps and, when every trap had a fish in it, they would all run down the hill and each would throw a brush fence in front of the trap, thus catching his fish. This story is probably of white origin, and the Indians find it amusing to pass it on. No matter what the origin of the term "Fish Traps" might be, the name has persisted to the present day.

The theory that these depressions were used as fish traps by aborigines can easily be exploded. In the first place, they were post-lake, and, in the second place, they would be functionless in a semi-fresh-water lake, which, of course, was tideless. Malcolm Rogers says:

> As fish traps they would not be effective in a tideless sea, and Indian informants[11] have often proclaimed them for what they were, houses, yet the misnomer persists. In other parts of the Salton Basin, such as the foot of the Fish Creek Mountains,[12] I have found them even above the highest terraces and invariably associated with potsherds, charcoal, and fishbone.[13]

In contrast to Rogers' statement, Strong reports the following part of the migration legend of the Sewahilem Clan as told to him by Akasem Levi, a Cahuilla informant:

> Then the water from the south began to rise and all the people moved ahead of the water toward Palm Springs. They settled near Kavinic, where the water did not reach. Here they lived for some time; then the water began to go back, gradually at first and sometimes rising again. All the people separated along the edge of the water to catch fish. . . . The three sons went fishing and the youngest built the fire, but his two brothers gave him none of their fish. They invited him to come with them again but he refused. He told his father how his older brothers treated him and they both wept. Then they went away together and hid. The next morning the two older brothers returned and could not find their father. They were puzzled and the older brother said, "Kelyicanuka has told our father how we made him build the fire but gave him no fish to eat, only the net to hold."[14]

Although this is only a myth, it demonstrates three significant things. The Indians mention a lake in which they fished. The sequence of events

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lake was formed by the same source. The presence of fish bones in camp sites on the southeastern shore of the old lake offers more concrete proof. Rogers, in Jaeger, 1938, p. 122.

[11] The informants were probably Cahuilla Indians.

[12] There is no doubt that Rogers is here describing typical stone circle sites that occur throughout this area. They differ from the pits under discussion in that they are not aligned on a series of recessional terraces.

[13] Rogers, in Jaeger, 1938, p. 122.

[14] Strong, 1929, pp. 86–87.

leading up to the origin and disappearance of the lake coincides with the known geological history of the lake, and, lastly, the use of a fish net is mentioned. No mention is made of any stone fish traps. Concerning the portion of the myth dealing with the lake and fishing, Strong mentions in a footnote the following:

> Along the western border of the desert next to the foothills of the San Jacinto and Santa Rosa Mountains are located a number of small stone pens about six to twelve feet long. These are locally known as the "fish traps," and it is claimed they were once used for this purpose when the Cahuilla basin was flooded. The local Indians corroborate this story in their legends and Akasem Levi told me that the "Fish Traps" west of Martinez formerly belonged to the Awilem clan. As Francisco Nombre, of the latter clan, has made the same statement previously on the basis of his clan myths, the independent confirmation of Akasem is interesting. This method of impounding fish employed by the Papago is mentioned by Lumholtz, *New Trails in Mexico*, 253, 1912; also for the Tarahumare: *Unknown Mexico*, 400, 1902.

In 1853 the Cahuilla Indians told R. S. Williams, when he inquired about the ancient shore line, "Big lake existed four or five generations ago, had many fish, water disappeared *poca a poca*, little by little."[15] Here fish are mentioned, but nothing concerning their capture.

The Colorado River tribes, fifty miles to the east, took fish from the river with several types of nets, brush pens, and hooks of cactus thorn and shell.[16] On the Pacific Coast, the Indians took fish in about the same manner, but added poisoning.[17] To the south, near San Felipe at the head of the Gulf of California, there occurs a stone fish trap.[18] It is in a tidal lagoon the neck of which has been dammed up with stones, leaving a narrow but fairly deep channel. In this part of the Gulf the tide runs high,[19] causing the lagoon to fill quickly. At the change of tide a brush gate was placed at the constricted part of the outlet so that, when the tide receded, the water ran out between the stones and sticks, leaving the fish stranded. Kniffen and Nelson both mention similar traps in the same region above the high-tide line, but details are lacking.

There is evidence for aboriginal occupancy of the Lake Cahuilla area during and following the formation of the lake. On the southwestern margin of the old shore line it is not uncommon to find artifacts, potsherds, and hearth stones coated with travertine.[20] In the same vicinity, similar artifacts and sherds occurring on camp sites occupying reces-

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[15] Williams, 1853, pp. 19–20.

[16] Gifford, 1931, pp. 25–26; 1933, pp. 268–269; Drucker, 1937, pp. 7–8.

[17] Listed for the Luiseño by Drucker, 1937, p. 8.

[18] The Kiliwa Indians knew of this trap but did not use it. Meigs, 1939, pp. 27–28; Kniffen, 1931, p. 58; Nelson, 1921, p. 18.

[19] Kniffen, 1932, p. 177. Spring tides rise 20 feet.

[20] Rogers, in Jaeger, 1938, pp. 121–122.

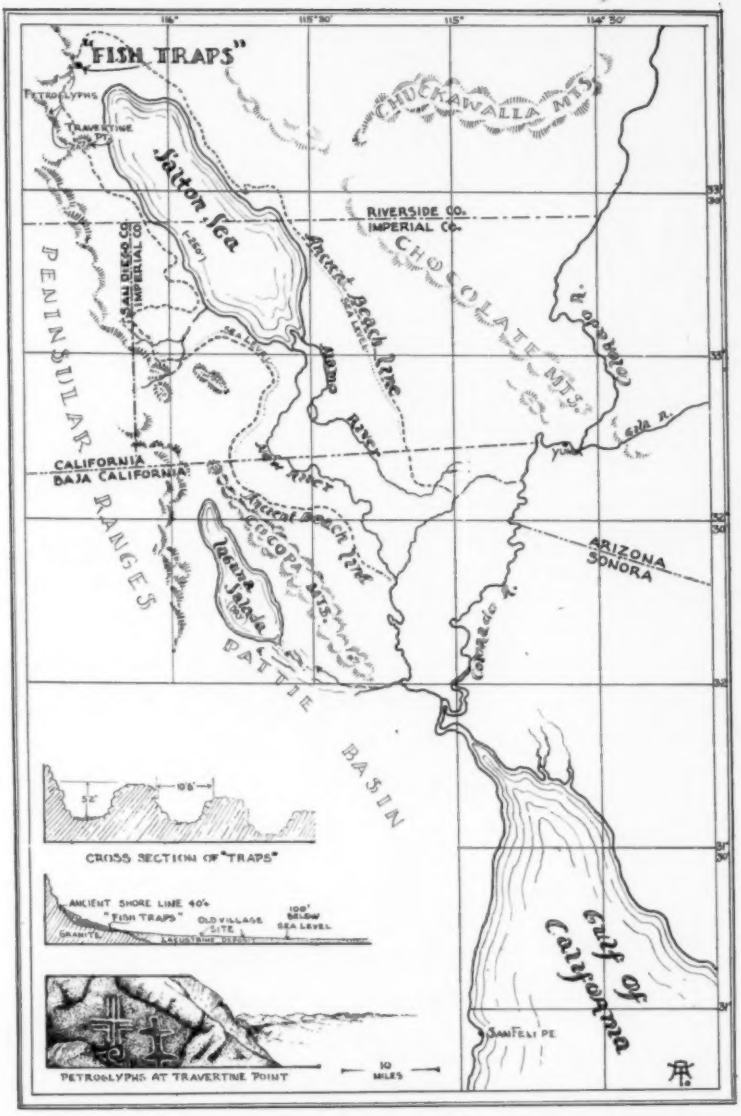
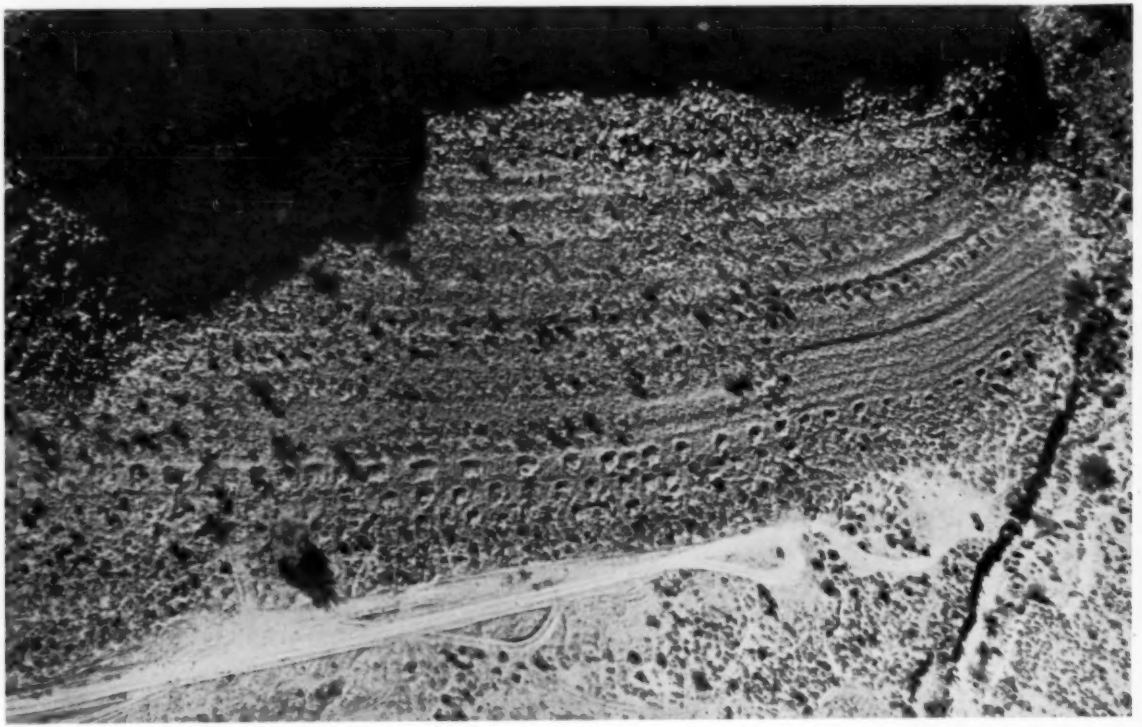


FIG. 21.—Location of the "Fish Traps" in relation to physiographic features of the area surrounding the Salton Sink.



Air view of "Fish Traps" from 2200 feet, showing three rows of depressions on talus slope following the well-defined recessional lake terrace lines. Sandy lake deposit in foreground. (*Photo courtesy of Dewey Moore, Riverside, California*)

sional terraces lack the travertine coating. These facts are evidence of occupation during the lake's existence and after its disappearance. Whether or not the area was occupied before the lake came into being is not clear, but it is probable that parts of the Salton Basin were occupied prior to the formation of the lake. That the lake had several high stages is demonstrated by the petroglyphs cut into the travertine at various points along the shore line.[21] At Travertine Point, which was an island during the times of high water, there are two series of petroglyphs. One group is faded and smooth because of the redeposition of travertine along the old lines of the designs; the other group, in contrast, is sharp and clear-cut, having been made subsequent to the last recession. In all known cases, the designs are cut into the travertine and not into the underlying granite base.

The elimination of the possibility that these man-made depressions were fish traps does not solve the problem, but merely opens up various other interpretations. A few of these interpretations should be discussed briefly and evaluated in the light of existing conditions. The regularity in the arrangement of the depressions, which is apparent even upon casual observation, is the result of their location along the natural contours of the terraces. It may be that the builders accomplished this symmetry merely by following the line of least resistance. In any case, the features were obviously constructed for some purpose.

Rogers presents ethnological evidence that these depressions mark the sites of former houses and accepts this interpretation without question. If they were house sites, they were not occupied for any great length of time, for in only two cases were evidences of habitation found in direct contact. These finds consisted of several potsherds at the southern end and some ash in the bottom of one of the pits at the northern end. Both of these could have been secondary intrusions. On the other hand, it would have been very easy for any amount of refuse to wash down the slope and become buried or to disappear into the porous surface of the rocky talus. The variation in the size of the pits is interesting; a pit 4 feet in diameter would not make a very suitable house even for a single occupant. If, for some reason, this immediate area was occupied when the lake was in one of its lower stages (say at the base of the talus), then, because of the rugged surrounding terrain, this talus slope would be the most suitable location. The reason for occupying this particular spot is difficult to guess, for there are other stretches of the shore line that are better fitted for living sites. In the Coachella Valley, there are a great many ancient village sites, all of which appear to be post-lake in origin.

[21] MacDougal, 1917, p. 464, Fig. 5 and map; Steward, 1929, pp. 86–87.

lake terrace lines. Sandy lake deposit in foreground. (*Photo courtesy of Dewey Moore, Riverside, California*)

One such typical village site lies not over a hundred yards from this series of depressions, to which it apparently bears no relation.

Stone circle sites[22] occur in the Great Basin area from Oregon to the Gulf of California, but in no place, to my knowledge, are they so constructed on a rocky talus slope. They generally consist of a simple ring of stones, seldom piled more than one tier high. The location of such sites is extremely variable, differing from region to region in apparently no set pattern.

In late aboriginal times, the common house type was the domed or semi-conical brush-and-sand-covered hut. Stones were sometimes placed around the periphery to brace the light pole framework. In historic times, the house, probably a Mexican introduction, is rectangular.[23]

Another possibility is that the depressions were used as blinds in which hunters concealed themselves during the communal hunting of antelope. In early times, antelope were found in California from the Mexican border to the Oregon-Nevada line. The Coachella Valley would have been an ideal natural habitat for these pronghorns. Although ethnographies dealing with this area do not state specifically that antelope were hunted, they do mention communal hunting.[24] The practice of communal driving of large game animals was widespread throughout the west, and there are good data relating to antelope for both the historic and prehistoric periods. In general, the technique was to impound a large number of animals in a corral, to drive them over a cliff, or to force them to pass hunters concealed in blinds at some strategic point. The success of such drives would depend upon the degree of utilization of geographical features, supplemented by manpower, and upon the use of artificial barriers and dummies where needed. While the physiography varies from area to area, the pattern of the hunt would remain basically the same. Near Bicknell, Utah, there is a series of stone walls and enclosures which were used for antelope hunting prior to 1833.[25] Some of the better preserved remains consist of two converging stone walls which draw close together near the crest of a ridge. At this point enclosures which concealed the bowmen were erected. In the Excelsior Mountains, about thirty miles from Hawthorne, Nevada, a rock wall was constructed along the side of a valley which terminated at

[22] Renaud, 1931, pp. 22–23, 95–98; 1932, pp. 25–26; 1942. Gates, 1909, was sent by Holmes to visit the site, as it had been reported they were Pueblo ruins. Indians told him they were fish traps.

[23] Drucker, 1937, p. 47, considers the rectangular house to be a relatively recent acquisition.

[24] Drucker, 1937, p. 7.

[25] Kelley, 1943, pp. 7–9.

the top of a cliff.[26] In addition to the wall, three stone enclosures were erected across the constricted portion of the valley. It is probable that some of the animals were taken with the bow and arrow, while others were driven over the cliff. In about 1850, Egan observed and left a good account of a communal antelope drive in Antelope Valley, Nevada.[27] Here, sage brush dummies were used along with the natural stands of vegetation. The converging lines ended in a compound or corral.

The physiography in the immediate vicinity of these stone depressions has certain features which could be ideally applied to antelope driving. Had this linear series of depressions been masked with brush they could easily have concealed hunters. Directly behind the depressions are a rocky talus and a steep cliff over which it would be almost impossible for an antelope to pass. At the northern end of the depressions a steep rocky hill extends for several hundred yards in a northeasterly direction. Actually, the cliff and talus on one side and the hill to the north form a two-sided enclosure around the depressions. A line of brush or people extended in a southeasterly direction from the hill to the north would create a line diverging from the cliff. Antelope driven into this converging trap would become easy prey for concealed hunters. Had the depressions been used as blinds at a time when the lake was still present but had receded several hundred yards from the base of the talus, the shore line would have acted as a natural barrier, and antelope driven along it would have had to pass within range of the concealed hunters.

If they had functioned as blinds for hunting water birds, the depressions would probably have been fewer in number and located around the shore of the lake in more strategic places, like those found around the shore of Goose Lake in Northern California.[28] Here the blinds are U-shaped piles of stones situated near the ends of small mud peninsulas.

It has been suggested that the depressions were roasting pits for mescal, as such features were common in this southern area; but, as a rule, roasting pits occurred singly or were few in number, and, instead of being open pits, like the ones under discussion, they were closed pits located in sandy washes and were filled with sand and carbon-smudged stones.[29]

It might be suggested that these depressions were designed for storage pits. We know from archaeological evidence that storage was in large pottery vessels and in baskets. In historic times the Cahuilla Indians

[26] R. F. Heizer's unpublished Nevada notes.
[27] Egan, 1917, pp. 238–241.
[28] R. F. Heizer's unpublished notes.
[29] Drucker, 1937, p. 9; Gifford, 1931, p. 23; Treganza, 1942, p. 156.

stored mesquite beans in large rough basketry containers which were placed on raised stands.[30] The emphasis in all cases was to isolate perishable material from rodent pests and moisture.

Their use as sweathouses seems unlikely. In California it was the general practice to have only one sweat house to a village. Kroeber[31] pictures a semisubterranean sweathouse for the Cahuilla Indians, but it cannot be compared to these depressions, as the differences between the two are too great.

Their are those who, for varied reasons, would attribute this arrangement of depressions to the work of nature. But we should not forget that we are dealing with two distinct types of structure. In one, stones are removed to form a circular depression, the bottom of which is composed of small talus stones; the other, constructed by arranging stones to form a rectangular enclosure, has a natural base and is not a subsurface depression. The presence of two such well-defined types certainly rules out the possibility of a natural agency in their formation. Furthermore, the fact that the depressions are post-lake would eliminate the possibility that waves or currents were instrumental in their formation.

CONCLUSIONS

I believe there is no doubt that the name "Ancient Fish Traps" is erroneous and is solely the outgrowth of local misinterpretation. An ancient lake containing fish existed from about 900 A.D. to 1500 A.D. and the evidence shows that Indians occupied the area during at least part of this period, as well as later. It is probable that the aborigines obtained fish from the lake,[32] but, so far, the archaeological evidence does not reveal the method of capture.

It seems more likely to me that these stone depressions are former house sites; however, they do not reveal evidence of extensive occupation. Because of their peculiar arrangement, varied dimensions, and location on the talus slope, they must be considered as a series of house sites unique for this area.

Since communal animal drives are known to the Indians of this area, I would suggested antelope blinds as a second possibility. On the basis of what is known concerning the techniques of communal driving, the physiographic location and structural nature of the depressions meet the requirements of such a function.

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[30] Kroeber, 1908, Pl. 2.

[31] *Ibid.*, Pl. 15.

[32] Rogers, in Jaeger, 1938, p. 122, mentions fish bones in site locations. Strong, 1929, pp. 87–88, mentions in a myth that fish were taken by nets. Williams, 1853, pp. 19–20, Cahuilla Indians speak of an ancient lake which contained many fish.

The verification of either of the two possibilities stressed and the value of the other suggestions depend upon further information and interpretations.

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PAINTED POTTERY FIGURINES FROM ILLINOIS

W. C. McKern, P. F. Titterington, and James B. Griffin

A RECENT discovery in west-central Illinois seems sufficiently interesting and important to warrant this initial descriptive report. Six small pottery figurines were found with a compound burial in Mound 8 of the Knight Mound Group. Five of these human effigies, apparently fashioned to represent the prehistoric people culturally responsible for these mounds, not only display the remarkably smooth, stylistic skill of the culture and artisan producing them, but are modeled and painted to show costumes and styles in personal ornamentation with sufficient detail to make an important contribution to our knowledge of the producers' material culture. The sixth figurine is extremely simple and devoid of detail, and is not painted.

The occurrence of any painted pottery figurines in North America north of Mexico is not so usual as to be devoid of general interest; but the stylistic finish of these products of a relatively high art, and their contribution to a knowledge of certain material aspects of a little known prehistoric cultural era, give added importance to this find. Here we have a cultural record of the past prepared by first-hand observers, the prehistoric subjects themselves.

This preliminary factual report includes descriptions of the five painted figurines (McKern) and a brief statement covering the Knight Mound Group and the cultural features encountered there (Titterington), including a description of the pottery (Griffin).

THE FIGURINES

Of the five painted figurines, one represents a seated man and four portray women, two standing and two seated. Two of the women, one standing and one seated, are carrying nude infants. All of the little effigies exhibit a rigid style in proportion, surface treatment, and in methods of modeling feet, hands, and the details of faces, suggestive of work done by a single artisan. The figures are ill-proportioned, with long bodies in contrast to short legs, and with large heads in contrast to minute feet; but the life-like postures effected and the professional sureness of the general treatment serve greatly to strengthen and preserve the impression of realism in spite of stylistic inaccuracies. The eyes are represented by pinched-up elongated ridges disposed obliquely. The upper lips are rather carefully modeled to show the philtrum and adjoining lip cleft.

All heads are equipped with widely protruding, disc-shaped ear-plugs. That these are ear-plugs rather than stylized ears is clearly indicated

by the fact that in one of the standing female figures the ears are realistically modeled above these elements.

The only male of the series (Pl. XX) stands $3\frac{1}{16}$ inches high. He is represented as kneeling and sitting on the medial aspect of each foot, with his feet turned inward toe to toe. He is holding before him a staff-like object with the head or handled end, which is painted red, placed under his chin. This staff has at its lower end the suggestion of an atlatl hook. The man is wearing the simplest kind of breech-clout. The entire body above the breech-clout and the left arm above the wrist are painted a dull purplish red, suggesting a shirt. The right arm is missing from just below the armpit to the wrist. There is no artificial coloring on or below the breech-clout. Looping from the top of each shoulder to pass under the adjoining arm is painted a broad band of white bordered with red and sectioned by transverse black lines at wide intervals. Lateral extensions of this garment or painted design extend outward from the neck well over each shoulder. The face is painted completely white. The headdress, whether representing hair or hair augmented by artificial accessories, suggests a low, long-haired pompadour anterior to an oval plat extending over the frontal region and separated at the crown from a similar plat covering the back of the head. Centered in the latter plat and protruding sharply from the back of the head, is a flatly disposed, thick disc. Both plats and the disc appear to have been painted black. The white color on the face extends up over the crown of the head between the two plats of "hair." The protruding ear-plugs are solidly red.

All of the female figures are nude above the waist and are similarly dressed in short, kilt-like loin-cloths extending from the small of the waist to barely below the knees. They all wear black or red foot coverings of uniform style, with tops extending well above the ankle and terminating in points above instep and heel with V-shaped depressions at the sides. Three of the women exhibit black and white arm bands. Three share the same basic style of hair arrangement: the back hair hangs down well below the waist. It is arranged in a flat plat which, at the neck, is the full width of the falling head of hair but which tapers down to a relatively narrow squared or rounded end toward the waist. This coiffure could be most easily effected through the use of some plastic element such as clay. The creator of the figurines provides no evidence of plaiting or artificial shaping accessories. To what extent realism in these representations is defeated by the artistic style of the modeler can only be conjectured.

One of the female figures (Pl. XXI), which is $3\frac{3}{16}$ inches high, is represented as sitting with both knees disposed obliquely to the right and both feet, one above the other, resting with heels against the left

Knight Mound Group. Kneeling male figurine (C°8-7). Height, $3\frac{1}{16}$ inches.

Knight Mound Group. Seated female figurine (C°8-6). Height, $3\frac{3}{16}$ inches.

Knight Mound Group. Figurine of woman nursing infant (C°8–10). Height, 3⅛ inches.

Knight Mound Group. Figurine of woman carrying infant (C°8–9). Height, $3\frac{11}{16}$ inches.

Knight Mound Group. Figurine of woman with knobbed headdress (C°8–8). Height, $4\frac{3}{8}$ inches.

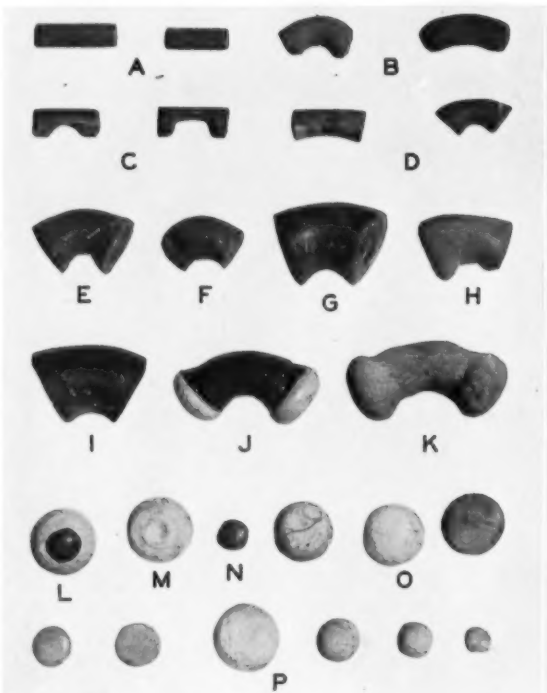

FIG. 1

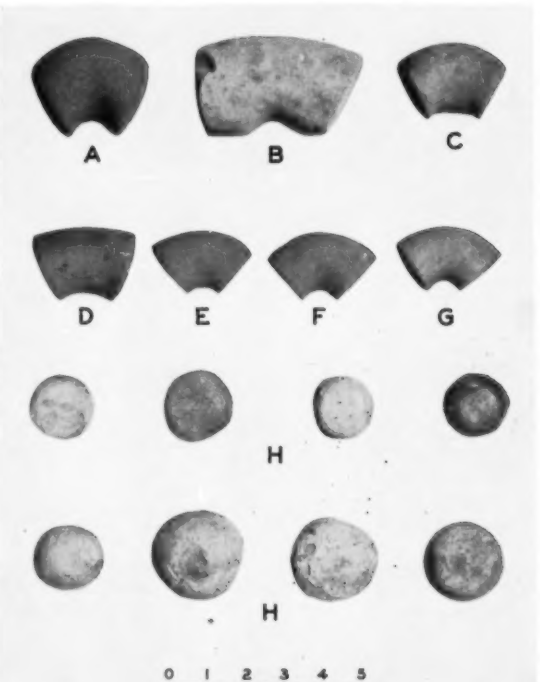

FIG. 2

Simple and composite nose plugs and end buttons from northern Arizona. Fig. 1, *A–K* illustrate the typological sequence suggested in this paper; *L–P*, simple and composite end buttons. Fig. 2, *A*, nose plug made of clay; *B*, largest and heaviest nose plug found (may be unfinished).

hip. This sitting posture is practiced not uncommonly by Indian women of the historic period. A Dakota woman, now residing in northern Wisconsin, recently demonstrated the posture to me and volunteered the information that this position was known as the Sioux women's method of sitting. In our figure, the right hand clasps the knees and the left hand rests on the abdomen. The kilt, which appears to be held in place without the aid of a belt, is solidly red. The "moccasins" are black with specks of white suggesting beads. Two broad black arm bands, similarly speckled with white, are placed just below the armpits, and an undecorated black band occurs above the right wrist (the lower left arm is missing). The hair is parted in the middle and curves smoothly down on either side of the face to pass back over the shoulders. Faintly surviving elements of both red and black paint are variously present on the hair. Ear-spools appear to protrude through falling strands of hair.

The other seated female figure (Pl. XXII), which is $3\frac{1}{8}$ inches high, assumes the same sitting position described for the first, but she is holding a nursing infant to her breast. Her kilt, generally, has vaguely defined decorative elements in black and red, but as viewed from the rear the garment is red with a broad white stripe, disposed somewhat obliquely from the vertical, extending down to the right of the center. The "moccasins" are black. The hair, arranged as described for the other seated female, seems to have been painted a solid black. The original color of the ear-spools is not now apparent. The infant's hair is not parted down the middle as in the adults but does curve down each side of the face. There is no plat down the back. All of the hair area above the adult's hand, which covers the occiput of the infant, is painted a light red, suggesting a head covering. There are black "moccasins" with faint white speckles on the feet.

The shorter of the standing figures (Pl. XXIII), which is $3\frac{11}{16}$ inches high, holds an infant on her back; her right hand extends back to clasp the child's right knee and calf, her left hand passes over her left shoulder to grasp the child's left wrist. The "moccasins" are black with white speckling, apparent particularly about the left heel. The kilt retains some of the original red color, and there are irregularly disposed white spots along both thighs. Black arm bands with white speckles are placed just below the armpits, and two similar bands occur above the wrists. The hairdress as seen from the front is identical to that of the two seated female figurines, but as seen from the back it differs from all the others. A heavy rope of hair is doubled back on itself in a diagonal direction and is fixed in place by means of cross-ties on the right side of the back of the head. The hair area at the back is painted red, with a mixture of black at the center of the occiput. The black extends up on the medial

gested in this paper; *L–P*, simple and composite end buttons. Fig. 2, *A*, nose plug made of clay; *B*, largest and heaviest nose plug found (may be unfinished).

arm of the loop of roped hair. The mixture of black and white on the top and front area of the hair, as seen in the accompanying illustrations, is accounted for by a slight scuffing or abrasion of the original surface so that the fresh clay is exposed. This is more or less solid at the top front, while at the left front it has more of a scratched appearance, with some of the original surface remaining intact. There is no evidence of paint on the infant. The hair or head covering has the same outline as on the other infant. The ear-spools, protruding through the hair of the adult, show no positive artificial coloring.

The fifth of the series of painted figurines, representing a standing woman (Pl. XXIV), is 4⅞ inches high. It represents a lady with a considerably more decorative costume than the others. The right "moccasin" is black and the left one is red, but each is decorated about the top with the usual white speckles. The kilt is black with a decorative stripe at top and bottom consisting of two parallel rows of laterally disposed white bars. Unlike the kilts worn by the other female figures, this one appears to be supported at the top by means of a broad red belt with decorations consisting of variously directed lines in pale orange. At the back there is a bustle-like apron, white except for a black band across the top, which falls to mid-buttocks. A bulge of somewhat irregular outline dominates the center of the white area. A small portion of this seems to be broken away. Although there is a definite incised division line between the bottom of the characteristic plat of hair hanging down the back and this "bustle," the outline of the latter is a continuation of the former. This would permit an interpretation of the "bustle" as the terminating end of the plat of hair. There are very wide arm bands, black with white speckles, at the usual places on both upper and lower arms, although an excavator's tool has nearly removed the evidence from the upper left arm. A necklace, consisting of several rope-like strands in white, conceals the throat. The face seems to be unpainted save for five white dots under the left eye. The headdress is basically like those of the two seated female figures, with certain curious additions. Two knobs protrude from the head, one diagonally forward from just within the hair line above the forehead, the other rearward from a point just back and to the left of the crown of the head. In shape, these are smooth domes set in broad basal rings. The dome parts are red and the encompassing rings are white. In addition, on the right side of the head there is a boldly protruding fillet, painted red, which curves high above the ear from the temple region to a corresponding point behind and above the ear. The right ear-spool is damaged and partly missing, but the left one, painted red, appears in correct position below the realistic representation of an ear done in bas-relief. Both ear and ear-spool appear to protrude through the hair. The two hands are placed above the upper legs

and appear to be holding foot-like objects disposed heel to heel. One of these "feet" is crossed just above the toes by a broad band of white; the other is black, like the kilt on which it rests.

A comparison of these objects with other pottery figurines reported from the Mississippi Valley is profitable in at least two instances. First, there are the figurines from the Turner group in Ohio.[1] These differ from the Knight specimens in many stylistic respects, although the treatment of hands and eyes is quite similar. Details in costume show some dissimilarities and a number of striking similarities. An abbreviated type of breech-clout constitutes the only certain element of dress of the male Knight figure (Pl. XX) and most of the male Turner specimens. The Knight male and most of the Turner males show no indications of foot coverings. The Knight male and one of the Turner males are kneeling with the feet disposed toe to toe (Pl. XX). A Turner female figure wears the kilt-like garment so characteristic of the Knight females, and there is a line at the back of this kilt which takes the same direction as the painted white stripe on the back of the kilt worn by one Knight female (Pl. XXII). In both instances the biased direction of this near-vertical line is very suggestive of the end of a wrap-around skirt of the type still worn by the women of some Indian groups in Middle America. The hairdress of the Turner female is very similar to that of one of the Knight females (Pl. XXII). However, the "moccasins" on the feet of the Turner female are not like those worn by the Knight figurines. Several of the Turner figures wear ear-plugs, but the means of representing them are quite different in the two series. One of the female Knight figures (Pl. XXIV) and four of the Turner specimens show similar knob-like protrusions as a feature of the headdress. Two are worn by the Knight lady, whereas only one is worn by each of the Turner figures, but the position and location of all the latter are identical to those of the anterior knob on the Knight head, and the knob on one of the Turner heads differs in detail from the Knight ornaments only in the presence of a double rather than a single ring at the base of the dome-shaped central element.

Second, there is the pottery figurine found at a Hopewellian village site at the mouth of Honey Creek, Delaware County, Oklahoma,[2] of which only the head has been illustrated in print. Stylistically, this object is quite different from either the Knight or the Turner specimens, but the eyes show the same oblique slant, and the costume elements

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[1] C. C. Willoughby, *The Turner Group*, Peabody Museum of Harvard, Vol. 8, No. 3 (1922); H. C. Shetrone, *The Mound Builders* (1930), pp. 120–121, 124.

[2] D. A. Baerreis, *Oklahoma Prehistorian*, Vol. 2, No. 1 (1939), pp. 4–5, Vol. 3, No. 1 (1940), front cover, p. 1.

include several which are strikingly similar to elements present on the Knight and Turner figures. The Honey Creek specimen has two rounded knobs protruding from the head: one in a frontal position identical to that of the anterior knob on the Knight figure and all the knobs on the Turner figures, the other protruding diagonally from the left side of the upper cranium. The frontal knob is very low and simply round, a type also present on the Turner figures; the knob at the side of the head is identical in shape and relative size to those present on the Knight figure. Moreover, just below the side knob on the Honey Creek head there is a curved bar-shaped element which arches high above the left ear. This feature differs only in relative length from the curved fillet on the knobbed-headed Knight woman (Pl. XXIV).

There certainly is sufficient similarity in detail apparent from a comparison of these three instances of Mississippi Valley figurines to support a conclusion of cultural relationship, a relationship which is further emphasized by the Hopewellian character of the cultural associations present in all three instances.

Other pottery figurines reported from the Mississippi Valley[3] are similar, in crudity at least, to the sixth, undescribed Knight figure and offer few if any features comparable to the colored Knight specimens.

THE SITE AND ITS CULTURAL PRODUCTS

The Knight Mound Group is on the farm of Mr. Chester A. Knight, on the east bank of the Mississippi River, in northwestern Calhoun County, Illinois. There are at least twenty-six mounds located on three ridges. Mounds 1 to 13 lie upon the summit of a somewhat crescent-shaped ridge, about 50 feet high, which extends parallel to the river on the second terrace. Mounds 14 and 15 lie on the southern end of a higher ridge to the northeast, about one-quarter mile farther back from the river. The third ridge, probably 250 feet high, lies one-half mile to the northwest. Mounds 16 to 26 are located upon it, and there are probably smaller mounds on beyond Mound 26. A survey of the entire ridge has been prevented by a dense thicket of scrub oak and wild grape vines. This ridge lies at right angles to the river.

Mounds 1 to 16, 22, and 26 are circular or widely oval in shape and are from 30 to 50 feet in diameter along an axis parallel to the ridge. They range from 6 to 12 feet high, excepting Mound 16, which is the largest. This mound appears to be a true conical and is about 60 feet in diameter at the base and from 20 to 25 feet high. It is situated on the end of the ridge overlooking the river.

[3] J. B. Griffin, "Additional Hopewell Material from Illinois," Indiana Historical Society, Vol. 2, No. 3 (1941), pp. 179–180, 184, 210; Fay-Cooper Cole and Thorne Deuel, *Rediscovering Illinois* (University of Chicago Press, 1937), p. 163, Pl. 34.

Mounds 17 to 21 and 23 to 25 are long, low, oval mounds ranging from 3 to 5 feet in height, distributed between Mounds 16, 22, and 26. They contain flexed burials and a few artifacts consistent with the Illinois Bluff focus of Jersey County. This focus differs from the "Illinois Bluff Culture," which is more Middle Mississippian in character, in that it shows a mixture of traits locally characteristic of both Woodland and Middle Mississippi manifestations.

The materials from the conical and high, wide, oval mounds are culturally consistent with Illinois Valley Hopewellian. One interesting feature is that the top 2 to 4 feet of Mounds 2 and 22 of this group had been capped with the flexed burials of the Jersey Bluff focus, the extended and bundle burials and the Hopewellian materials occurring at the lower levels. On the other hand, Mound 5 had Hopewellian materials both in the top 4 feet and with the central feature at a depth of 11 feet.

The Hopewellian materials which have been found are made of stone, bone, shell, metal, and pottery. Objects of stone are a curved-based monitor pipe of Ohio pipestone, a gorget, mica, flake knives, arrowheads, and scrapers of characteristic types. Objects of bone and antler include awls fashioned from the leg bones of birds and the split tibia of an elk, a spatula from a section of split rib of some large animal, a cut section of a wolf mandible, handle-like objects of antler, and both real and imitation bear teeth. Objects of shell include small globular and marginella beads, drilled pearls, pendants, mussel-shell spoons and hoes, and large conch-shell containers. The metals are represented by unworked pieces of galena, red ocher, and a copper ax. Pottery is represented by the painted and unpainted human figurines and by pottery vessels many of which represent Hopewellian styles.

Mound 8 produced the painted baked-clay figurines found by W. L. Wadlow in October, 1942. This mound measured 40 by 50 feet at the base and was 6 feet high. There are large trees around it, and its height, no doubt, has been reduced and its base increased by the stock which has taken advantage of the shade and has used the mound as a "fly stomp." At about the center of the southeast quarter of the mound, a foot above the base level, Mr. Wadlow found five extended skeletons, three of adults and two of children. Three were disposed with the heads to the northwest and two with heads to the southeast. There was a pot at either the top of the skull or at the shoulder of each skeleton. At the feet of the central skeleton, that of a male, in an area about a foot in diameter, were found the fragments of the five painted figurines, six flake knives of pink flint, a small unworked piece of galena, and an unpolished, cone-shaped piece of diorite. The Milwaukee Public Museum cleaned and repaired the figurines.

At about the center of the east half of the mound, two feet above the

base level, the lower legs of a small child were found. In about the region where the lower left chest should have been were an unbroken, unpainted, relatively crude pottery figurine, 2¾ inches high, and two small fragments of broken figurines, the parts being unidentifiable.

Nearly all of the potsherds, three or four of the more badly broken but restorable pots, and photographs of all the other pots (about 30 in number) were sent to James B. Griffin for examination. He reports:

The pottery from the C. A. Knight group covers a wide range from the standpoint of ceramic typology and the cultural and chronological associations of these different types. However, the majority of the pottery is characteristic of the granular-tempered types of decorated and undecorated wares found in the central Mississippi Valley during the period of Hopewellian dominance. A few sherds belong with such late Woodland groups as those classified as the Maple Mills focus,[4] and there is a small number of specimens which may be attributable to Middle Mississippi. These latter two pottery classes are not numerous or well represented and are presumably later than the occupation responsible for the development of the mound group.

The five vessels placed with the burial feature in Mound 8, with which the figurines were associated, are all limestone-tempered, small, ceremonial jars. They offer examples of the Hopewell Zoned Stamp and other decorative styles placed on many Hopewellian funerary jars.

The use of both crushed rock and crushed limestone for the tempering material and the correlation of the design techniques and styles with these two kinds of temper will form an important section of a future detailed report on the pottery from this site. Somewhere south of the Havana-Naples area in the Illinois Valley Hopewellian culture there is a significant break between north and south in the type of site and ceramic remains. This is reflected in the Knight Group by the relatively high percentage of limestone-tempered pottery and by the relative absence of the Naples Stamped style of decoration. There is again at this group an intimate association of ornately decorated vessels primarily associated with burials and vessels belonging to the plain and cord-marked Woodland style, some of which were also used as burial furniture or placed with Hopewellian-style pottery. The detailed analysis of this material contemplated for the future should shed considerable light on the diverse origins of the pottery complex associated with Illinois Valley Hopewellian sites.

Milwaukee Public Museum
August, 1943

[4] Cole and Deuel, *op. cit.*, Pl. 3, Figs. 1–3.

FACTS AND COMMENTS

NOSE PLUGS FROM NORTHERN ARIZONA

In the summer of 1935 it was realized that a large group of sites just to the east of Flagstaff, between the San Francisco Peaks and the Little Colorado River in north-central Arizona, were in several respects unique.[1] The presence in this northern area of ball court structures similar to those recognized in southern Arizona by Haury and others was the most outstanding single feature.[2] Subsequently, more detailed research revealed additional southern, or Hohokam-like characters in these sites, and a program of several years of extensive excavation and research was undertaken.

The results of all this work have been published in a series of reports and bulletins.[3] Two sites, or general areas of sites, have been more intensively worked than others. These are known as Winona Village and the Ridge Ruin sites.[4] In the course of this detailed work, wherein the use of W.P.A. assistance made extensive screening possible, a great many small objects, particularly ornaments, were found.

The inhabitants of these sites seem to have carried on rather extensive industries in two mediums. The first was work in hides, as evidenced by the great number of flat rubbing- and work-stones found in all sites.[5] The second was the construction of some rather elaborate stone jewelry. One of the most popular types of material used in the making of ornaments was a red argillite derived from a known source to the southwest.[6] It was often combined with turquoise to produce some rather remarkable effects.

Only after considerable work had been done on these sites, and in this area, were nose plugs found and definitely recognized as such. They first came to light in cremation burials where only one was found in each burial.[7] This suggested they were worn as single ornaments, not in pairs. Their curved and notched shape further suggested that they must have been worn in the nose rather than in the ears.

In 1939, when systematic work was undertaken at the Ridge Ruin site proper, the use of these ornaments was settled beyond question. Here a remarkably rich burial was discovered which still had the nose plug, an unusually large and ornate specimen, in place at the lower margin of the nose.[8] Subsequently, Haury, working at Ventana Cave in southern Arizona, found a mummy which had a straight wooden nose plug in place in the central septum of the nose.[9] Both of these finds have now definitely established the use of such ornaments in the Southwest.

At the completion of this work, and at about the time when the most comprehensive report concerning it appeared (1941), several individuals who had long collected such archaeological specimens from this area came forward with still other examples of nose plugs.[10] These showed greater variation, both in style and workmanship, than had been known previously, and several of them have been included as illustrations in this report.

The use of straight or curved nose plugs made of stone now seems to have been limited to a relatively small area just east and north of Flagstaff (see map, Fig. 22). Here they constituted one of the more or less diagnostic culture trait components of four foci:

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[1] McGregor, 1937, p. 3. [2] *Ibid.*

[3] See general bibliography at end of this paper. Other reports have been made in *Southwestern Lore*, Gunnison, Colo. [4] For the most complete single report on this work see McGregor, 1941.

[5] McGregor, 1939, p. 53. [6] Bartlett, 1939. Note particularly p. 77.

[7] McGregor, 1941, p. 206. [8] McGregor, 1943, p. 280; 1941, p. 206.

[9] McGregor, 1943, p. 280. A report on Ventana Cave by Haury, now in press, will contain further details regarding this find.

[10] The most complete collection was donated to the Museum of Northern Arizona at this time by Mrs. Margaret Meade and is now in the collections of this institution. Other equally interesting specimens were secured from Mr. J. R. Babbitt, also of Flagstaff, and may be seen in the same museum.

the Winona focus, the Angell focus, the Padre focus, and the Elden focus.[11] Similar ornaments will probably be reported from the Verde Valley to the southwest, which is culturally very closely allied. They do not seem to have been in use very long, probably not earlier or later than the period between about 1050 and 1200 A.D., so that they may be considered a fad rather than a definitely established and long-lived trait.[12]

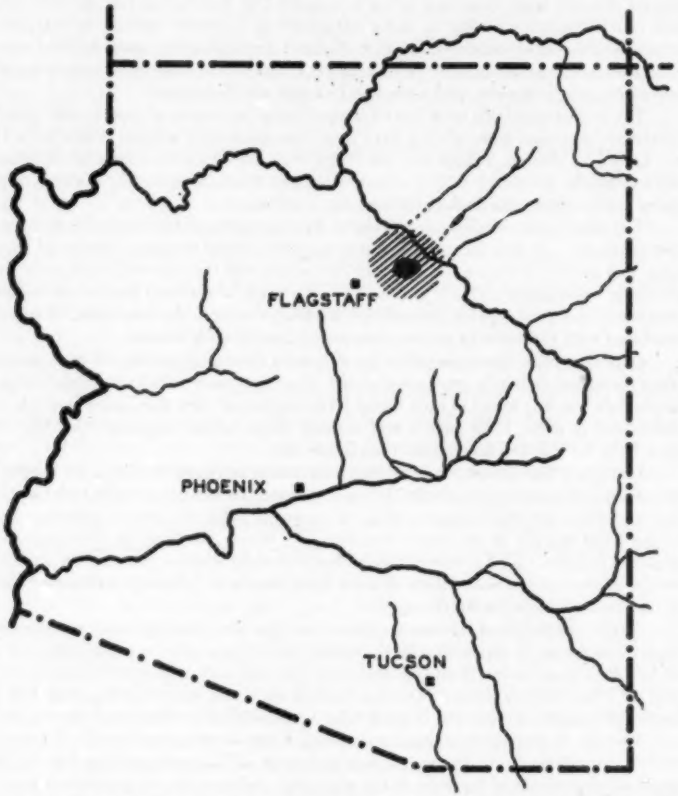

FIG. 22.—Map of area in which nose plugs have been found. The black area represents the zone of greatest concentration, the hatched area, the known geographic extent of these artifacts.

As previously reported, the various types of nose plugs appear to fall into a definite typological sequence.[13] Some substantiation of an evolutionary sequence has been given

[11] For a detailed discussion of the relation and significance of these foci see Colton, 1939.
[12] For dates see McGregor, 1941, p. 21. [13] McGregor, 1941, p. 206.

through correlation with various foci of this culture.[14] The simplest form seems also to have been the earliest (Pl. XXV, Fig. 1*A*). This was a straight, unembellished cylinder of argillite with flat ends. The second type was similar but slightly curved, or was a cylinder which was notched on one side (Pl. XXV, Fig. 1*B*, *C*). Later the cylinder became expanded at the ends and bent downward (Pl. XXV, Fig. 1*D*). This was followed by even larger forms in which the expanded ends were hollowed slightly and had ornamental buttons attached to them with lac (Pl. XXV, Fig. 1*E–J*).

The known sequence remained as outlined until additional specimens were turned over to the writer for study by Mrs. Margaret Meade and others. These nose plugs were collected from small sites mostly to the north of the Winona and Ridge Ruin areas, or toward the Little Colorado River. Perhaps the people who made them were the occupants of the hinterland or, more properly, the guardians of the boundary of the area in which they lived, for they employed many substitutes and evolved several elaborations.

One of the most interesting types of substitute is illustrated by Plate XXV, Fig. 1*K*. This large nose plug was made entirely of calcite, and, though it was rather well executed, it was not finished with extreme care. Several examples of this type were covered on the outer surface with a light green pigment, probably malachite. An even more interesting type of substitute is shown in Plate XXV, Fig. 2. Many of these were made of fired clay. Note particularly the clearly shown drying and firing cracks in *A* of this figure. Some of these nose plugs achieved remarkable size, like Plate XXV, Fig. 2*B*.

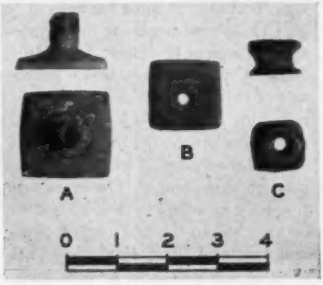

FIG. 23.—Types of lip or cheek plugs mentioned in the text. *a*, straight stemmed type; *b* has been broken and the base has been ground flat for secondary use.

Not only was considerable information secured concerning the body of the nose plug, but more was learned of the additional end ornaments. The turquoise end buttons of Plate XXV, Fig. 1*J*, were found in association with the plug and stuck to the wedge of lac by which they were attached to the body of the ornament. These were beautifully shaped and finished round buttons with holes drilled through their approximate centers. The lac was squeezed through these holes to act as a sort of rivet. At this time it was suggested that some of the similarly shaped shell buttons found in this work were probably used in a similar manner.[15]

The lower two rows of Plate XXV, Figs. 1 and 2, show a number of these shell and turquoise buttons. Some are of truly colossal size, like the lower central pair in Fig. 2, which are well over two centimeters in diameter. Several of these buttons have additional depressions in their rounded outer surfaces, like Plate XXV, Fig. 1*K*. The purpose of these became obvious when the red argillite body of a nose plug was found with two such shell discs and two smaller buttons, also of red argillite. These are shown in Plate XXV, Fig. 1*M*, *N*, and obviously were originally combined with lac as in *L* of this figure.

Such a combination reached the height of elaboration in this field. The bent body of the plug, of red argillite, was flanked on each end by a wedge of golden red lac securing two shell buttons to the outer surfaces of which two smaller buttons of polished red argil-

[14] *Ibid.*, Table 10. [15] *Ibid.*, p. 208.

lite were attached by lac. This must have represented the ultimate in fashionable facial jewelry of this place and period.

Found in the same foci, except for the latest or Elden focus, and in the same area are several small ornaments which have been called lip or cheek plugs. These are illustrated in Fig. 23. They were also made of red argillite, and in shape they very strongly suggest collar buttons. Two distinct forms have been found, one shaped like a collar button (Fig. 23*C*) and another with a straight stem (Fig. 23*A*). These seem to be definitely southern in their associations and are not nearly so frequent in these sites. However, they undoubtedly do represent a trait of this culture complex, This problem has been discussed at some length elsewhere.[16]

SUMMARY

Nose plugs, or ornaments which are cylindrical or somewhat cylindrical and were worn in the nose, are found over a restricted area in the Southwest (see map, Fig. 22). They are also restricted in their cultural distribution, being found as traits of only the Winona, Angell, Padre, and Elden foci. The time during which they were in use was not long, probably at most between about 1050 and 1200 A.D.

These ornaments are one expression of an unusual culture mixture found in this restricted area at this time. The culture is confined to an area over which fell cinders from Sunset Crater and into which people were attracted from widely spread regions as a result of this phenomenon.[17] The only other location within the Southwest from which a nose plug is known is Ventana Cave in southern Arizona.

These ornaments may consist of a simple body, usually made of a carefully shaped and polished piece of argillite but sometimes of modeled clay or carved calcite, or they may be more ornate. The more ornate specimens may have round buttons of shell or turquoise attached to their ends with lac. A second smaller round button of argillite may be attached to the first button. Some of these nose plugs are quite small, as little as 15 mm. long and 7 mm. in diameter, others are huge. The largest nose plug body found was of stone and was some 43 mm. long. Such ornaments, therefore, occurred in an unusual variety of forms and sizes.

CONCLUSIONS

1. Nose plugs found in the Flagstaff area seem to be unique insofar as the Southwest is concerned, with the exception of one wooden example found at Ventana Cave in southern Arizona.

2. They are definitely restricted in area and time and to a definite culture complex.

3. The nearest use of somewhat similar ornaments known to the writer is Mexico, where lip or cheek plugs were also in vogue, but these, though similar, were quite different in detail.

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MAYA SUN CALENDAR DICTUM DISPROVED

For an observer within the "tropics," the day-count for a sun calendar is easily determined to the nearest day on four occasions: on the two equinox days, which are the same for all cities, and on the two zenith passages of the sun, which depend upon the observer's latitude. *Sunset observations alone*, contrary to a tacitly accepted dictum, determine the precise day of equinox, and the average 365¼-day length of the "tropical year," if the record is continued over several years.

At equinox time, from the Capitol, in Washington, D. C., successive sunsets disappear behind the Washington monument, which is due west, much as drawn to relative scale in Figure 24. At a distance of some 7000 feet, the obelisk hides an angle of about 27 minutes of arc, while the daily advance is 24 minutes along the horizon; and the sun's diameter is 32 minutes of arc.

The precise time of crossing the equator occurs at or near sunset once every four years. During the three "common," or 365-day years, the sunset position appears to recede about one-quarter interval per year, but our European calendar adds a February 29, making leap year 366 days long and thus restoring agreement between calendar and sun. In general, however, on March 20 the sun falls short of the obelisk, and on March 22 it has passed beyond. Similar sunrise observations counted for an eastern horizon marker, provide a check and help to locate the vernal equinox. All these phenomena are repeated on the sun's return on September 23, locating the autumnal equinox likewise to the nearest day.

Cloudy weather necessitated much interpolation, but it was not difficult for me to mark along a sidewalk a continuous calendar by lining up a yard stick with the setting sun and a harbor beacon some 2000 feet off shore. For separation, the return series of sunset marks after June 22 was painted on the opposite edge of the walk. Marks for the same day around equinox time were connected by a zigzag line for five consecutive years, to show limits of variation. Here the day-count is certain to the nearest day, but this is not so around solstice time.

In June and December in our high northern latitudes its oblique descent makes the disk of the setting sun appear to slide along the horizon while setting. Although single pointings were correct to the nearest foot, uncertainties of refraction made a probable error of five feet, and this made separation impracticable for marks around solstice time. The solstices are best located by counting days just half way between equinox dates.

The symmetry which is true of the periods between solstices does not hold for equinoxes. It is 186 days from March to September 23, the summer half-year, and only 179¼ days from September 23 to March 21, the winter half-year. The inequality of seven days was utilized by the Maya for a unique location of their calendar, but first let us consider zenith passages and other probable astronomical observations which enabled their priests to gather the data tabulated in their codices.

Mrs. Zelia Nuttall[1] has summarized the historical evidence of the observance of special ceremonies, marking the sun's passage through the zenith. Zenith passage day is precisely counted when the noonday shadow angle is zero. On that particular date a vertical obelisk casts no shadow at noonday, for the sun is directly over the observer's head. A sunbeam reflected from a basin of water, returns exactly to the hole in the ceiling through which it enters a darkened room. At Copan the daily motion, which is eighteen minutes per day, defines the day-count unmistakably—the reflected sunbeam falls short of the ceiling hole the day before; the day after, it has passed beyond. "Among the Zuni Indians a rude calendar is made by the sunlight passing through a small hole in the walls of their huts, and falling on certain marks, by which the different seasons are indicated."

Surviving manuscripts picture the use by the Aztecs of V-shaped notches like gunsights for star pointings. The design of the Aztec calendar stone shows division of the circle into four quarters and of each quarter into fifths, thus providing for the continuous band of twenty day signs. The Maya had words for the cardinal directions north, south, east and west. A plumb line is suggested by the negative batter of their building façades, and certainly would suggest itself for transferring oblique sky sights to the ground. Upon the ground a ten-foot pointer pivoted about a central point is ample equipment to record pointings along the edge of a twenty-foot circle.

A point halfway between the elongation marks of the circumpolar stars locates true north; this line, produced backward from the pivot, points due south, defining the observatory meridian. Sunrise marks along the east circumference, when joined by a stretched string to the sunset mark of the same day along the west circumference, define an east-west line. Only on equinox days does this line pass through the pivot and define the "prime vertical" plane which the sun crosses at equinox.

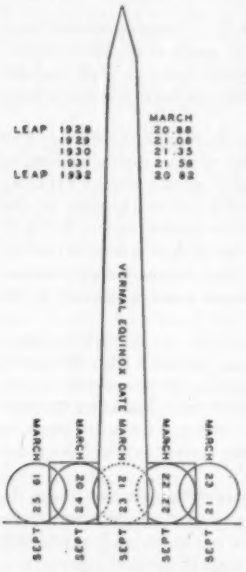

FIG. 24.—Progression of moment of equinox between leap years.

Dr. J. Eric Thompson states "the Peruvians divided the year into 12 or 13 lunar months, which were brought into line with the solar year by observations to determine when the sun was overhead in late spring and early autumn. At Quito there existed an elaborate temple dedicated to the worship of the sun. This was a square structure built of well cut stone, with a door facing the east. Outside, there were two columns for the observation of the equinoxes, or possibly to indicate when the sun was at the zenith. In addition there were twelve other columns, the shadows of which are said to have marked the passage of the lunar months." Four windows of the Caracol at Chichen Itza approximate the four cardinal directions, but not very accurately.

Without accurate clocks the Maya were unable to trace the sun precisely across the background of fixed stars. The inferior conjunction of Venus counted the eight days of disappearance accurately to the nearest day. The age of the moon was checked at each quarter as accurately as at conjunction. The Maya recorded periods of visibility in place of conjunctions which could not be directly observed by them.

[1] Tomo, XVII, Num. 20, Mexico Publicationes de la Secretaria de Education Publica, 1928.

Pio Perez has been translated, "The ancestors of the Maya Indians with no instruments, just using the naked eye, had fixed the beginning of the year on the day the sun reaches the zenith of this peninsula on its way to the austral regions." Ola Apenes has noted[2] that the winter interval between zenith passages of the sun for a latitude slightly south of the ancient ruined city of Copan, in Honduras, was precisely 260 days, an interval identical with the length of the Maya sacred tzolkin. The Maya "tun" was a 360-day counting unit, and, to the nearest day, half a tun just fits into the winter half-

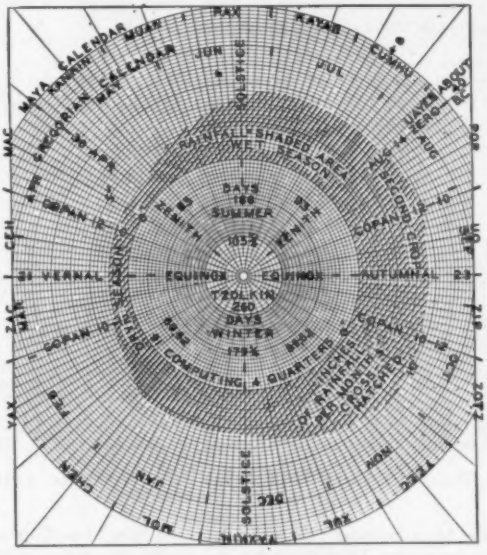

FIG. 25.—Sun calendar cycles.

year of 179½ days, or nine even months of twenty days. At Copan it was just forty days, or two even months of twenty days, between the dates of zenith passage and equinox day. Furthermore, the so-called astronomical base line lay just half way between these two precisely counted dates. Professor Willson's conclusion in 1916 was that "the sun, from stela 12, would set behind stela 10, 20.3 days after the vernal equinox, and 20.6 days before the autumnal equinox."[3] Of course, similar sunrise observations in the opposite direction defined a sunrise just an even month or twenty days' journey south of the equinoxes.

We conclude, therefore, that initially the start of the Maya calendar began with the zenith passage at Copan on August 14. Sunrise and sunset observations check the zero position of each month in turn. There ensues an interval of 2+9+2=13 months, or 260 days, until the spring zenith passage on April 30. The remaining 105 days until

[2] *Ethnos*, Jan. 1936, pp. 5–8.
[3] In S. G. Morley, *The Inscriptions of Copan*, p. 133.

August 14 fill five months of twenty days and the five nameless days of the quarter month Uayeb which closes the year. Note the lack of symmetry at the summer solstice, and how the seven-day inequality takes care of the five terminal days.

This "vague" 365-day year advanced in position in the month one day in four years. It was in month position 5 at the end of the first katun, and in month position 13 at the end of the first "calendar round." The zenith passage at Copan on August 14 became the fixed datum of reference, and, knowing the precise rate of advance, the problem could be worked backwards. Knowing the month position of the day forty days before autumnal equinox, the accompanying diagram tells at a glance, at least the four-year group to which it belongs in the Maya calendar.

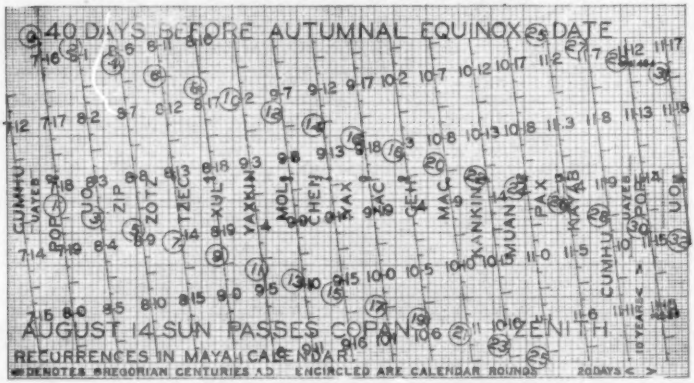
40 DAYS BEFORE AUTUMNAL EQUINOX = DATE
AUGUST 14 SUN PASSES COPAN ZENITH
RECURRENCES IN MAYA CALENDAR
DENOTES GREGORIAN CENTURIES A.D. ENCIRCLED ARE CALENDAR ROUNDS
20 DAYS

FIG. 26.—Position of August 14 in Mayan Calendar, 100 B.C. to 1500 A.D.

To tie in the Maya calendar year with a "farmers' year" based on the agricultural cycle of wet and dry seasons, Dr. Spinden has presented in *The Reduction of Mayan Dates* a rainfall chart. This has been redrawn on the polar diagram in Figure 25. This shows, in addition to his emphasized relation to the solstices, that August 14 marks the harvesting of the second crop, while April 30 marks the close of the dry season and the coming of the rains. On pages 112–117 Dr. Spinden tabulated the position of Maya new year's day, zero Pop, in the Gregorian calendar, by counting backward in time from known historic Spanish records. His conclusion that zero Pop fell on August 14 about 1464 A.D. should not be far wrong.

Dr. Teeple notes[4] that 29 calendar rounds was an excellent measure of the complete zero Pop cycle. It returns to its initial agreement with the sun after 550, 420 = 29×52×365 days = 1508 "vague" years = just 1507 Gregorian calendar years. Did the Maya recognize this? According to the Goodman-Thompson correlation, the initial series date 11.16.0-0-0 13 Ahau 8 Xul fell on A.D. 1539 November 4 Julian = November 14 Gregorian calendar. Accepting with Dr. Teeple[5] the beginning of the Maya era 4 Ahau

[4] *Maya Astronomy*, pp. 38–40.
[5] *Ibid.*, p. 35.

8 Cumhu of bactum 13 = 0 as August 12, 3114 B.C., the length of three "zero Pop cycles" was 4577 years, an average of 1525 years per cycle. This was a better approximation than the Egyptian "Sothic period" of 4 × 365 = 1460 years for the sun-vague year cycle.

The article "Calendar," page 994 of the eleventh edition of *Encyclopaedia Britannica*, discusses the mathematics for locating the Julian-day zero point at 4713 B.C. Probably the Maya era zero date problem was similarly intricate. Just as the date for beginning the Christian era involved counting backward several centuries of astronomical phenomena from the time of the Council of Nicaea, similar use of the Maya records may have involved similar errors.

A possible date for beginning the observational day count and inauguration of the Maya calendar is therefore found at about 40 B.C. Month positions could be checked at eight observation points at least; but *sunset observations alone* were sufficiently precise to determine the length of the tropical year.

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BOOK REVIEWS

Archeological Explorations in the Cordillera Vilcabamba, Southeastern Peru. PAUL FEJOS. (Viking Fund Publications in Anthropology, No. 3, New York, 1944.)

The appearance of Dr. Paul Fejos' report of his work in southeastern Peru will be greeted with enthusiasm by all who are familiar with the problems raised by the Bingham explorations of 1911–1915. The report is an excellent account of two seasons' work in 1940–1941, in a small area just east of Machu Picchu, where Bingham reported the existence of four sites and some well-preserved Inca roads. In addition to clearing the four sites noted by Bingham, Dr. Fejos located and cleared five additional sites of great interest. The work was professedly exploratory, and a minimum of excavation was undertaken.

Toward the end of the second season, while I was in Cuzco starting explorations for Project 7 of the Institute of Andean Research, Dr. Fejos invited me to visit his work. I spent a week there in September, 1941, and made two subsequent one-day visits. Dr. Fejos was most hospitable and gave me an opportunity to visit all the sites I had time for and to do any excavating I wanted. I visited all the sites described in Dr. Fejos' report except Runcu Raccay and the isolated "House" (Pl. 77) and made small sherd collections at Phuyu Pata Marka, Sayac Marka, Chachabamba, and Choquesuysuy, as well as at the two small excavations described in Appendices A and B of the report (pp. 61–65). The collections are on deposit at the Archaeological Institute, Cuzco, in the laboratory of the Sección Arqueológica. I am deeply grateful to Dr. Fejos for his generosity in making possible so much work by a mere visitor.

Three seasons of subsequent work in the Cuzco region for the Institute of Andean Research and the University of Cuzco have put me in a position to make some additions to Dr. Fejos' conclusions which may be of interest to readers of his report. In the first place, it is possible to be quite specific about the date of these sites, amplifying Dr. Fejos' conclusion that they belong to the Late Inca period. The arrangement of the sites, the manner in which they are joined together by a network of improved foot roads, and the fact that they all show the same architectural style indicate that they were all occupied more or less simultaneously, and the same observations can be extended to show that they were occupied at the same time as Machu Picchu, which is one of the type sites of the Late Inca period. The evidence of the pottery found points to the same conclusion. Sherds are not abundant at any of the sites, and are mostly so badly weathered as to defy classification, but, with the exception of a few unusual fragments from Choquesuysuy which appear to be local variants, all the recognizable pieces belong to the Cuzco Series, which is of Late Inca date.[1] A few recent or modern sherds were found at Phuyu Pata Marka, which seems to have been used as a hideout by smugglers in recent times. The region in which these sites lie was first conquered by Inca Pachacuti, probably in the 1440's, and seems to have been abandoned some ninety years later at about the time of the Spanish conquest.

Fejos' report gives a somewhat exaggerated impression of the Inca population of this region (pp. 28, 59). Even counting storerooms and rooms whose function was probably ceremonial, and making an allowance for rooms too ruinous to be measured without excavation, the plans show that there were never more than 150 rooms in the whole area. I very much doubt if these rooms were ever occupied by more than five or six hundred souls at any given time. Machu Picchu, with about two hundred rooms, probably had under one thousand inhabitants.

[1] See J. H. Rowe, *An Introduction to the Archaeology of Cuzco*, Peabody Museum Papers, Vol. 28, No. 2, Cambridge, 1944.

Except for small patches of level ground along the Urubamba River, the area around Machu Picchu is uninhabited at the present time, because its combination of steep slopes and heavy rainfall makes agriculture virtually impossible. The Inca invaders probably found it uninhabited in the fifteenth century for the same reasons; certainly no traces of earlier occupation turned up during Dr. Fejos' clearing operations. Why did the Incas devote so much attention to this region? The answer probably is that they were attracted to it by a combination of strategic and religious considerations. The Incas were interested in controlling the tribes of the lower forest valleys, and the occupation of the Machu Picchu region provided improved communications to the important valleys of Vilcabamba and Convención. In addition, the wild peaks and rivers of the region would be especially likely to impress the Inca mountain and river worshippers as important supernatural powers. My interpretation of Machu Picchu and the sites described in this report is that they represent a deliberate colonization program organized by the Inca government. Phuyu Pata Marka, Inty Pata, and Wiñay Wayna with their extensive terraces seem to have been essentially agricultural colonies, the products of which probably supported the inhabitants of the other sites. Sayac Marka was probably a shrine, while Machu Picchu, Chachabamba, and Choquesuysuy were shrines with subsidiary agriculture. The Inca colonists probably abandoned the whole area as soon as the progress of the Spanish conquest made it safe to do so.

I entirely agree with Dr. Fejos' statement that none of these sites was built for defense (p. 60). Indeed, no defense was needed at this point, for the Inca frontier was many miles below in the forests, and the forest tribes lacked the numbers, the organization, and the weapons for a successful attack on the highland settlements. Dr. Fejos is also right in his identification of the ruin represented in Figure 15 as Bingham's Runcu Raccay (pp. 52–53). I have seen a copy of a sketch plan of Runcu Raccay made by Bingham's expedition and preserved in the Yale University Library, and there is no doubt that it represents the site visited by Dr. Fejos.

The report confines itself to architecture because no small objects were found beyond the potsherds mentioned in the text. This fact is not surprising, since such objects would probably be found in and around the houses, and Dr. Fejos purposely avoided digging out the buildings he found. Judging by Bingham's experiences at Machu Picchu, I doubt if any great quantity of small objects will ever be found in these sites.

It might be well to call attention to a few small imperfections in the report, for some of which I and not Dr. Fejos am responsible. Between the time of my visit and the publication of the Chucuito Conference classification of Inca pottery, some changes were made in the names of pottery types. For "Cuzco Plain" read "Cuzco Buff," and for "Cuzco Slipped" and "Cuzco Red on White" read "Cuzco Red and White." Plate 19 was not taken from the point marked in Figure 9, and does not represent any of the niches in the alcove where I dug (compare elevation, Fig. 16). The orientation of Figure 16 is wrong; north is at the bottom of the plan, not at the right (compare Figs. 2 and 9). Consequently, read "west cross wall" for "south cross wall" in the last line on page 61, and correct all subsequent compass directions accordingly. On the general map (Fig. 2), Machu Picchu is shown almost two kilometers south-southeast of its true position. Machu Picchu was not included in the original survey, but was added by estimation from some map like Figure 1 during the preparation of the manuscript. Sr. Araujo's isometric drawings are accurate in gross measurements, but failure to draw each stone to scale makes them unreliable in detail (compare, for instance, Pl. 34, bottom, with Pl. 36).

I doubt if anyone who did not visit Dr. Fejos' work will be able to grasp the full extent of the labor and leadership that his expedition demanded. The expedition worked in a rugged wilderness at the end of a supply line sixty miles long, under unpleasant

climatic conditions, and with 200 to 900 inexperienced workmen. The obstacles surmounted make the achievement described in this report doubly impressive. Let us hope that after the war it will be possible to carry out the excavations for which Dr. Fejos' work was the indispensable preparation.

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The North Highlands of Peru: Excavations in the Callejón de Huaylas and at Chavín de Huántar. WENDELL C. BENNETT. (Anthropological Papers of the American Museum of Natural History, Vol. 39, Part 1, pp. 1–114, 1944.)

Bennett's customary quality of workmanship characterizes this report on the fourth and final of his Andean expeditions for the American Museum in 1938. Three months were spent in the Callejón and one month was spent at Chavín. A one-man expedition, with modest resources for labor, can scarcely undertake excavations on a monumental scale or hope for front-page results. Bennett has shown his proved skill in covering ground, sinking or withholding test pits, and making every stone and sherd count to get a maximum of sound results from a minimum of resources.

Along with Willey, Strong, and the reviewer, Bennett has come around to accepting Chavín as the beginning of things now known in the Peruvian culture sequence—as earlier not only than Tiahuanaco but also than Mochica (Early Chimu), as Tello has always contended. What with the Larcos finding coastal Chavín (Cupisnique) underlying Mochica, this point can be considered settled. What Bennett has added is to show what the Chavín ceramic style at Chavín was like. It is monochrome and simple: only 7 per cent of all fragments are decorated (mainly grooved, incised, punched, or gouged; out of 3000 sherds only 10 are painted, 5 with red fill in grooves). There is no clear evidence of stirrup-spouts, although 28 "spouts of some kind" were found. This tallies with a sample recently shown in this journal by Tello. The result is this curious situation: the Chavín type site, for all its extraordinary sculpture, has a pottery much simpler than the Chavín-type Cupisnique pottery of the coast, which expresses far more of the spirit of the Chavín sculptured style.

Positively post-Chavín at Chavín is a white-on-red ware recurring in the Callejón. Late material of not very marked characteristics occurs at Chavín, but the Recuay as well as the Wilkawain styles of the Callejón have not yet been found at Chavín, in spite of the proximity, just as Bennett encountered no Chavín style in the Callejón.

In the Callejón, Bennett got white-on-red, Recuay, Wilkawain-Tiahuanacoid, and Inca-influenced San Jerónimo styles. Of these, white-on-red, similar to that at Chavín, suggests antiquity, but there is no proof; it may be connected with Chancay and Salinar white-on-red, as Willey and the reviewer are also conjecturing. Recuay positively underlies Wilkawain-Tiahuanacoid. This proof is one of Bennett's skillful accomplishments, as is his association of Recuay pottery with below-ground galleries of unknown use. There is a much-needed analysis of the Recuay style wares. The reviewer's attempted segregation of B from A, incidentally, can be illustrated from Bennett's Plate 2, where Figures G, H, and I are B, and J is A; the difference is in manner of surface paint. However, if the forms prove identical, B and A would reduce to paint-design strains within one style. In any event, the Recuay style is now established as pre-Tiahuanaco.

Tiahuanacoid is represented by several tomb and house sites at Wilkawain near Huaraz. There is no doubt of the presence of a Tiahuanacoid element in this material; but it is surprisingly dilute—definitely feebler than on the coast at Supe, Ancón, Nievería, Pachacamac, or even Moche. Why this should be so is not clear. But it is in accord with Kidder's and McCown's results; and the heuristic principle seems to be building up

that the Coast cultures were more receptive to foreign influence and therefore better indicators of widespread diffusions like Chavín, Tiahuanaco, and Inca; whereas the Highland centers remained more resistive and clung to their local manners, even when these were relatively backward. It begins to look as if the Highland consisted of series of pockets, most of them remaining chronically and provincially undistinguished, but with a few—Chavín, Recuay, Inca, Pucara, Tiahuanaco, etc.—temporarily achieving creative originality of style. Even these fine distinctive styles, however, tended to remain locally provincial in the Sierra: it was the adaptive Coast that made them metropolitan and spread them. Witness how Northern Titicaca Basin Pucara style seems to have effectively blocked the Southern Tiahuanaco, and vice versa (Kidder), and how Bennett found no trace of Recuay at Chavín or of Chavín at Recuay, though they are only a day's journey apart.

Some Coast Tiahuanaco material occurs in collections in the Callejón. But as Bennett encountered none in the ground, it is a fair inference that this Tiahuanaco represents occasional lots anciently traded in from the Coast, perhaps supplemented by modern mixing or ignoring of proveniences in the assemblage of collections.

Bennett very cautiously and almost hesitantly separates his subterranean house site 9H-2 material at Wilkawain from that obtained from above-ground-house and deep-tomb sites 7H-1–4, 6H-2, 7H-5A. He speaks (p. 53) of its being "slightly earlier" and "slightly pre-Middle" in time position; but in his chronological summary (p. 109) he does not leave a special place for it. That the time interval was short is probable enough; but the distinctness of the 9H-2 ceramics seems to the reviewer much more accentuated by the table on page 51 than its resemblances to the three Tiahuanacoid sites. It *lacks* negative and three-color positive painting, annular-base plates, double-spouts and double-bowls, tripod plates and sieves, pressed relief, and Tiahuanaco design. (Note, incidentally, how most of these coastal Tiahuanacoid diagnostic features do not occur at Tiahuanaco itself.) But only the 9H-2 material *has* grayware, trumpets, annular-base bowls, flaring-sided cups, white-on-red ware, cursive-design spoons. This means that this lot has Recuoid, White-on-Red, and Cajamarca, instead of Tiahuanacoid, affiliations; surely sufficient to give it a definitely separate time horizon—as well as indicating the pre-Tiahuanaco position of Cajamarca and corroborating it for Recuay and White-on-Red.

As regards Late material, Bennett comments (p. 108) on the surprising "absence of a well-defined Inca period or of any distinctive Late period in the Callejón and at Chavín"; which fits in with the principle outlined above.

There is a lot more in this monograph than can be discussed here: new data on house and tomb types, construction, relation of these to wares, and so on. Its basic importance will be evident from what has been cited. If the author maintains his intention of devoting his future field explorations to the northern Andes, it will be the loss of Peruvianistics, but we hope an even greater gain to the archaeology of less-known Ecuador and Colombia.

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Contributions to the Archaeology of the Illinois Valley. FRANK C. BAKER, JAMES B. GRIFFIN, RICHARD G. MORGAN, GEORG K. NEUMANN, AND JAY L. B. TAYLOR. (American Philosophical Society Transactions, N. S., Pt. 1, 210 pps., 68 pls., 4 figs., 1 map, 16 tabs. Philadelphia, 1941.)

One's own field notes have a nasty habit of becoming very "cold" and difficult to cope with after a short lapse of time, but to take the notes of another investigator, after

they have reposed in storage for thirteen years, and convert them into a contribution of utmost value is a task most of us would eschew. Such a feat has been accomplished in this report by Griffin and Morgan who jointly prepared the text dealing with cultural materials and interpretations. Neumann and Baker had the advantage of actual materials to work with and were not of necessity too deeply involved with data as to exact provenience.

As stated in the preface, this "contribution fittingly closes the studies of Dr. Warren King Moorehead, . . . " who, for nearly twenty years, was interested in the Illinois area. In one respect this report is monumental to the memory of Moorehead for it undoubtedly is the best with which he had any connection. Best, not due to any shortcomings on his part, but rather because of the fact that the data were edited by specialists in certain fields who had all the advantages of specialization as well as the fuller knowledge which had been acquired during the years that the field data were filed away. Interpretations which are presented in this volume would not have been possible in 1928 or 1929 no matter who the author might have been. Griffin with his knowledge in the field of ceramics and Morgan with his background in both Illinois and Ohio made possible the utilization of every bit of pertinent data. As one who knew and appreciated Dr. Moorehead this reviewer can fittingly say that he is gratified with the delay intervening between exploration and reporting.

The work involved in this report is a continuation of an archaeological survey of the Illinois River Valley which was presented, in part, in 1928 as Appendix B of Moorehead's *The Cahokia Mounds* issued as a Bulletin of the University of Illinois. As a consequence the text opens with notes relating to the resumption of survey work in March of 1928. The "scope of the territory covered" includes a list of sites, some of which are not reported due to lack of cultural material and they are so indicated in the list. However, there is some confusion in that the Rebmon mounds and the Lewis mounds are included in this category and yet are indicated in a list of sites on page 5 as being components described in the report. They are also indicated on the map of Illinois archaeological sites. In the map referred to, and the list of components accompanying it on page 5, there are discrepancies. Seventy-seven sites are shown on the map and only seventy-four in the list. The three which are missing are the Eliza site in Mercer County, the Running Lane site in Union County and the Ullen site in Pulaski County. All three are shown on the map as Woodland components. The map symbol for the Corbin site indicates it to be Woodland whereas in the list it is included as a component of the Maples Mills focus of Woodland. This map, incidentally, is a valuable addition to the report, for even though it covers many sites not dealt with in the text, or even examined by Moorehead and Taylor, it serves to point out to the reader the relatively large number of important sites in Illinois for which there is available data. It also calls attention to the rather large amount of work which had been done in the state prior to the time that the University of Illinois and the University of Chicago became active in the field. Notable among these pioneers was Dr. J. F. Snyder who not only used the best methods in exploration, but used vision in predicting the cultural sequences in the area. Dr. Snyder's writings are more numerous than those of any other author cited in the bibliography. These facts will probably come as a surprise to many.

The field notes used in this report are those of Jay L. B. Taylor who did much, if not all, of the actual field work. These notes have been "somewhat condensed" but no important details have been omitted.

Between the text, tables and artifact descriptions there are occasional differences which perhaps no amount of editing would remove. These are not serious so far as final results are concerned. Bone awls should be added to the list of traits for the Kamp Mound group. Bundle burials are questioned as a trait in the list for the Havana group but are shown as present in the text on page 17.

Wherever the data made it possible, there is a simple statement of cultural affiliations following the textual description of excavations, pottery and artifacts, for each component. These statements serve to locate the individual components in their proper setting as to phase or focus as the case may be. The general conclusions cover the results of the survey as a whole and this reviewer feels that the editors are being too modest when they suggest that the "concluding section might better be labelled 'speculations'." The materials recovered by Moorehead and Taylor, as borne out by the text and illustrations, seem ample enough to justify the conclusions reached by Griffin and Morgan. Especially is this true when consideration is given to the fact that they drew upon materials for comparative purposes which had been recovered by others over a long period of time. Since the subject report was released, two publications have been issued by the Indiana Historical Society, one by Griffin and the other by Quimby, which deal with Illinois Hopewellian and a northern Indiana-southern Michigan focus of Hopewellian. Both of these reports substantiate the views advanced in the subject report as it relates to Hopewellian. Of the three cultural manifestations encountered in the area by Moorehead and his collaborators, Middle Mississippi, Hopewellian and Woodlands, Hopewellian is by far the most vexing problem to the systemist eager to place it in its proper cultural and chronological setting. In this respect the editors have made no attempt to make more of their data than the data itself justifies.

Part II, by the late Frank Collins Baker, is a study of the zoological remains resulting from Moorehead's work. Baker had long been interested in the faunal remains produced by archaeological explorations and many of the reports coming out of Illnois have included his studies as a valuable part thereof. In the future, such studies as these by Baker, should be based upon occurrences within components and by depths within components in order that they be of maximum value to the archaeologist. The subject study is the most comprehensive ever contributed by Baker. It was also his last. Henry van der Schalie, Museum of Zoology, University of Michigan, has kindly contributed the following remarks upon Mr. Baker's list of mollusk shells from the several sites and for which Baker alone was responsible. "This information is particularly valuable because it has obviously been compiled with considerable care and there is accuracy in determinations. The fundamental value of such a study can as yet hardly be fully appreciated. However, even in these early beginnings there is evidence that a knowledge concerning the animals contained in the sites can be of aid in determining possible trade or cultural relations with tribes in surrounding areas. Mr. Baker has found two species—one a mussel (*Lampsilis ovata*), the other a snail (*Anculosa praerosa*)—which have never been reported to inhabit normally streams in Illinois. Both species are common to the Ohio River and its tributaries in Kentucky so that they have presumably reached Illinois through trade or barter. Aside from the cultural relations which these animals might suggest there is an immediate problem as to the usefulness of the animals found. Although several important suggestions have been made regarding the possible food value of some of the species, these matters are, as yet, not definitely solved. One interesting problem concerns the use of fresh-water mussels as food. It has been established according to this report that some of the mussels eaten were baked. The question might well be raised whether baking was usually applied. It is known that mussels become very tough when boiled and one wonders what culinary practices were employed to make mussels palatable. Another interesting fact was the presence of larger land snails in the Plum Island pits. Mr. Baker suggested that these snails were probably used as food much as similar large snails are eaten today by peoples in Europe and elsewhere. This would be an interesting addition to our knowledge of foods. Or is it perhaps possible that these snails were dead remains from colonies formerly established on these sites? Perhaps, as more such basic and carefully compiled information is accumulated these and other related problems will become more readily understood."

Part III is by Neumann and covers a study of eleven crania from the Hagan mound. Neumann compared these crania with those from the Gooden mounds and found them to be so similar that they could be pooled. These were next compared to a pooled Middle Mississippi group and were found to differ widely. The importance of this study lies in the fact that cultural units were used as a basis for grouping cranial material.

The sixty-eight plates provide clear illustrations of burials and artifacts covered by the report. Especially is clearness manifest in most of the reproductions of bowls and sherds which are of a type to make clearness highly desirable.

Those who contributed to this volume, Taylor, the editors, the University of Illinois, and the American Philosophical Society, should all feel amply repaid for their efforts. It stands as a monument, as has been previously stated, but it is more than that. It is almost unique in being the published record of notes and materials which otherwise might gather dust in storage cases, available to only a few, and never again "see the light of day." There are far too few such examples.

GLENN A. BLACK
Indiana Historical Society

Mankind So Far. WILLIAM HOWELLS. (New York, Doubleday, Doran and Co., Inc., 1944, pp. xii+319. $4.50.)

The fifth volume in the American Museum of Natural History Science Series, *Mankind So Far* is a popularly written account, intended for the layman, of the origin, evolution, and present characteristics of man. The style, as befits a student of Hooton, is distinctly easy, amusing, and witty; it is no *damnosa hereditas*. The public for whom it is written will prefer twopence colored to penny plain, and here is their book. There are many things in the book with which the present reviewer cannot agree, but these are mostly controversial matters and need not be raised here. There is, however, one serious defect which should be mentioned. The frontispiece represents the reproduction of a photograph of what purports to be "An Australian Aborigine." The word should be "aboriginal" (plural = aborigines).[1] This photograph is credited to the American Museum of Natural History; actually it was taken by Frank Gillen fifty years ago and was reproduced in Spencer and Gillen's *The Native Tribes of Central Australia* (London, 1899), and as Figure 8 in the same authors' *The Arunta* (London, 1927). Dr. Howells' frontispiece is a badly overprinted libel on the original, for, apart from the fact that it obscures most details, it conveys the impression that the subject possessed a very black skin; the original photograph shows that this was not so. Finally, the legend describes the Australian aboriginal as the "most 'ancient' or primitive of living men." Is there, in fact, any reason to believe that the Australian aboriginal is any more "ancient" or "primitive" than is any other type of living man?

Dr. Howells' discussion of the subject of the "races" of mankind is in the tradition of the nineteenth century. For his discussion of the peoples of Europe he relies chiefly upon Coon. In many places where clarity might have benefited the reader groping in the dark for a little light, Dr. Howells contributes his own quota of error. A good example of this is his discussion of the Jews. The following statement deserves some sort of a prize:

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[1] ED. NOTE. *Webster's New International Dictionary*, 2nd ed., Unabridged, 1939, gives the following: "**aboriginal** n. 1. an aborigine. 2. An animal or plant native to the region. *Rare.*

aborigine, n.; pl—**rigines**. . . . 1. One of the earliest known inhabitants of a country; one of the native race, esp. as contrasted with an invading or colonizing race.

2. pl. The original fauna and flora of a geographical area."

REVIEWER'S NOTE. I prefer to err with the *Oxford English Dictionary*, which points out that *aborigine* is etymologically as indefensible as *serie* or *indice* as singular of *series* or *indices*. Is it by the *best* usage or the most common usage that we should be guided in these matters?

"They [the Jews] have never simply mixed freely with other segments of the European population, or they would otherwise long since have disappeared, as Jews. And their long inbreeding has preserved that almost indefinable conformation of the nose. . . ." (p. 242). The Jews are, without a doubt, the most mixed people on earth today, and the reason they have not disappeared before now is that they are a quasi-national group which has tenaciously held on to its cultural quasi-national traits. They could never have disappeared physically because they were never at any time a physically homogeneous people. As for the "almost indefinable conformation of the nose," so-called Jewish types of noses were long ago demonstrated to occur less frequently among Jews than among non-Jews!

But if there are lapses of this sort—and there are many—Dr. Howells' book also possesses many virtues, chief among which is the simplicity with which many technical details are made clear to the reader. The illustrations are, in general, good, and there is a useful index.

M. F. Ashley Montague
Department of Anatomy
Hahnemann Medical College
Philadelphia, Pennsylvania

NOTES AND NEWS

APPOINTMENTS BY THE PRESIDENT

In accord with Article VII of the Constitution, President Mason has appointed the following committees:

Budget Committee; Frederick Johnson, *Chairman*, The Executive Committee.

Auditing Committee; Maurice Robbins, *Chairman*, J. Otis Brew, Leaman F. Hallett.

Nominating Committee; N. C. Nelson, *Chairman*, Emil W. Haury, Arthur C. Parker.

Program Committee; F. H. H. Roberts, *Chairman*, Henry B. Collins, Julian Steward.

Committee on Local Arrangements; Frank M. Setzler, *Chairman*, Neil M. Judd, Waldo R. Wedel.

NOMINATIONS FOR NEW OFFICERS

Before the annual meeting, the Nominating Committee will consider the names of persons to be nominated for the position of President, two Vice-Presidents, and two members of the Council. Members are invited to make any suggestions regarding the names of persons to fill these offices to Dr. Nelson, American Museum of Natural History, New York, 24, N. Y.

THE ANNUAL MEETING

By majority vote of the Council, the Annual Meeting will be held in Washington, Saturday May 19, in the assembly room of the Cosmos Club. This city was again chosen because of the present residence there of many members of the Society.

The meeting will follow the pattern of that in 1944, primarily for the transaction of the business of the Society. It will probably consist of an afternoon business meeting followed by a few scientific papers, possibly a dinner, and an evening session with a symposium or discussions. The Chairman of the Program Committee, Dr. Frank H. H. Roberts, Bureau of American Ethnology, Smithsonian Institution, Washington 25, D. C. will be glad to consider papers submitted for discussion, or to receive any suggestions. These should be in his hands by April 1.

THE PLANNING COMMITTEE OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY: A PRELIMINARY STATEMENT

On July 20, 1944 Dr. J. Alden Mason, President, in forming the Planning Committee wrote, "The first duty of this Committee will be to consider the status and disposition and use of the archaeological data, reports and objects secured by the various archaeological projects of the late WPA. Later they will consider, in connection with the Basic Needs Committee of the National Research Council, any other policies pertinent to the welfare of American Archaeology, or of this Society."

The Committee believes that in considering the data secured by the WPA, it should limit its discussions to questions of fact, particularly the present status of the WPA projects, the quantity, type and location of the information and collections. In view of the lengthy discussions at the Annual Meeting, in May, 1944, the Committee assumes the responsibility for recommending ways and means whereby archaeologists may be informed concerning: (1) the type of information which has been secured by the WPA, and (2) the place in which this information is located. The Committee also believes that it is in no way concerned with the quality or possible criticisms of the data per se, or with the manner in which it was secured. In making plans to study this data, the Committee recognizes all the prior claims and rights of sponsoring organizations and individuals.

Several methods of completing the first duty of the Committee have been suggested: (1) the compilation of an index or directory to the material, (2) that it stands ready at all times to offer any aid within its power either to sponsoring institutions or individuals, in order to obtain satisfactory completion of the projects in which they are engaged. These ideas are now being given the careful attention of the Committee and it welcomes any comments or suggestions. Numerous questions may be included under the description of the Committee's later duties but discussion of these has only just been initiated.

Frederick Johnson, Chairman
R. S. Peabody Foundation
Andover, Mass.

James B. Griffin
University Museums
Ann Arbor, Michigan

Emil W. Haury
Dept. of Anthropology
University of Arizona
Tucson, Arizona

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INFORMATION FOR AUTHORS

AMERICAN ANTIQUITY is concerned primarily with archaeological matter, but articles dealing with related fields may be accepted providing that their connection with the archaeological field is clear. Manuscripts must be typewritten on standard 8½×11 paper, on one side only, double spaced. Articles should not exceed a length of 7500 words without subsidy by the author.

Bibliographies must follow a standard form; citations from journals should be given as follows:

JENKS, ALBERT E. AND LLOYD A. WILFORD.
1938. "The Sauk Valley Skeleton." *Bulletin of the Texas Archeological and Paleontological Society*, Vol. 10;

citations of separate books or reports:

JENKS, ALBERT E.
1936. *Pleistocene Man in Minnesota.* University of Minnesota Press.

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